

## A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES.

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### Apparatus for Burning Petroleum.

This engraving represents a plan for burning petroleum to heat water either for generating steam or for culinary purposes. The method employed is to sallow the petroleum to flow into a vessel containing and or fire-clay, on the surface of which it is ignited American Institute.

and burns steadily without creating smoke. This sand supplies the place of a wick in a lamp, and the vessel containing it is placed directly underneath the boiler, as common furnaces are. The oil is forced up to the pan by water pressure. The details are as follows:-

The oil chamber, A, is supplied with oil through the pipe, B, and there is a reservoir, C, which is filled with water. This reservoir communicates by the pipe, D, with the oil chamber, and its flow is controlled by the cock, E. There is also a compartment, F, above the oil chamber, which is also filled with water to keep the oil cool; this water rises no higher than the outlet, G. The fire pan containing the sand is at H, and communicates with the oil chamber by the pipe, L. The bottom of the pan is slightly inclined so as to diffuse the oil evenly all round, being also turnished with grooves, as in Fig. 2, for that purpose. There are holes, J, in the furnace door, and also air pipes, K, through the bottom of the pan to admit air to the flame.

These are the principal parts. Water is let into the chamber or reservoir, A, so as to cover the inlet pipe for oil, and the latter fluid is then filled in, as before described; being lightest it floats on the surface until it finally rises through the central pipe into the sand box or fire pan. The sand is completely saturated with the oil, which burns freely when ignited, creating an intense heat.

There is no danger of accidental explosion with this apparatus, for the oil is entirely covered or surrounded by water.

It is claimed to be applicable to stoves for culinary purposes, and also to land or marine engine boilers. In the case of the land engine, the oil chamber may be removed to a distance from the fire box, as in the yard, for instance, where a special building could be constructed for the purpose, and the oil pipe could be carried under ground.

On board of a ship the oil chamber might be 111 the hold or near the keel, and the water reservoir on

nothing but design could set it on fire. It could also be supplied to the fire without exposure to sight, touch or smell. A model of this invention will be on exhibition, says the Inventor, at the Fair of the

tanks covered with water, remote from fire and where gines, and the quality of their work will speak for itself.

### A New Plan for Raising the Atlantic Cable.

Louis Olin writes to the London Morning Star:-After the return of the Great Eastern I conceived

a plan for fishing out the cable. I submitted it to some friends of mine, among whom was a scientific gentleman. They found it so practicable that they advised me to publish it. I proposed to start three ships instead of one, each ship having a wire rope of great strength attached to the stern, of at least three miles in length. At the end of this rope I would attach a thick ring, weighing several hundred pounds, through which the end of the cable at Valentia should be passed; the ships would then be obliged to tollow the cable, as the least deviation would be indicated by the angle described by the ropes. The ships would be from two to three miles apart, the Great Eastern in the middle; and, when within ten or fifteen miles of the broken end of the cable, would, by a signal from the Great Eastern, stop and begin the winding up. When the cable is raised a mile high, the first and third ships would stop, leaving the Great Eastern to finish the work; by this means the slack of at least six or seven miles of the cable would be available to raise it to the surface of the water, even if the depth were two miles." [This plan may seem

plausible at first sight, but a very little reflection will show it to be impracticable. In any considerable depth of water the lower end of

For further information address E. McKinney, at the line carrying the ring would lie along the bottom Box 372, Clarksville, Tenn., by whom it was patented of the ocean, and the ring would rest flat on the ground, with the cable bending through it and pressing it hard on two sides. In these circumstances no power could drag the ring along, and, if all the tackle should hold, the Great Eastern would be effectually archored in mid ocean.-EDS.

M'KINNEY'S APPARATUS FOR BURNING PETROLEUM.

through the Scientific American Patent Agency on July 25, 1865.

### Paterson Locomotives.

An anonymous correspondent, writing from Paterson, says:-The heaviest engines turned out of Paterson, however, are those built for the Baltimore and Ohio Railroad by the New Jersey Co., and which are 194inch cylinders, 22-inch stroke, with 8 coupled wheels, and flues 15 feet long by 21 inches in diameter. Patdeck. The petroleum in this way might be kept in erson shops are not behind in the size of their en- ning into the mold, three minutes and a quarter.

A LARGE CYLINDER.—A cylinder of 100 inches in diameter-the largest ever cast at the navy yard in Washington-was successfully cast recently. amount of metal used was 58,000 lbs; time of run-

### THE GREAT ENGLISH MACHINE WORKS.

The private iron ship-building works of England are of three classes. 1. Those that manufacture within one inclosure every part of a ship, including armor plates for iron-clads. 2. Those that manufacture steam machinery for ships. 3. Those that confine themselves to rolling armor plates and every kind of rolled work.

PRIVATE IRON SHIP YARDS.

There are in England two immense private establishments for the construction of iron ships, each as extensive as a government dockyard, and each containing appliances more modern and elaborate than any to be found in the public yards. The chief of these is the Mill Wall Works, formerly owned by Scott Russell, Esq., builder of the Great Eastern. The works cover 27 acres and have a water front of 1.900 feet. There are 4,500 men employed in the yard, and the business is conducted on a capital of \$2,500,000. The yard is divided into two parts by the public street, the one on the river bank containing the vessels under construction, and the other having the ma-chine shops, founderies, etc. The works are not all modern nor are they advantageously arranged. They have grown from small beginnings and present much the same appearance as an old house which has had additions made generation after generation in the distinctive style of each. The forge contains six heavy steam hammers; here are made all the heavy forgings for the steam machinery, etc., of the vessels under construction. The smithery contains 97 fires and several small steam hammers. Rolled work of every description, from sheet iron to armor plates, can be made in the yard.

The Thames Company, whose works are situated near the Mill Wall Company's, rank next, and indeed are second only in not being prepared to roll armor The first great British iron-clad, the Warrior, was built here. Rolled plates are found to be superior, and though this company still build many large sized iron-clads, they procure the armor from other companies. The destinctive peculiarity of the Mill Wall and Thames Companies, over all others in Great Britain, and, indeed, in the whole world, is that they take rough iron scraps, chiefly with some puddled iron, in at the gate, and in a few months sail it out of their yard in the form of magnificent and well-appointed ships, ocean steamers and iron-clads. With the single exception of armor-plate rolling mentioned in connection with the Thames Company, every process connected with iron ship building is performed within the walls of their yards. Seven or eight heavy ships under construction, with the manufacture of every part belonging to them, progressing simultaneously, is not an unusual sight in each of these yards.

OTHER YARDS.

Next in order comes the establishment at Birkenhead, owned by Laird Brothers, where the Alabama and other rebel vessels were built under the protection of the British Government. The works cover about 19 acres, and are remarkable for containing two large permanent stone dry docks, for the construction of vessels, which are not often found in private establishments. These are 410 feet long, 85 feet wide, and of depth enough to take in the largest vessels afloat. From one of them the iron-clad frigate Agincourt, 380 feet long, and 6,621 tuns measurecompany that large vessels should be built company to the company that large ves ment, has lately been floated. It is the theory docks, as it saves much labor, and, besides, avoids the serious straining which they suffer in launching. Another feature of these works is an enormous pair of rolls 18 feet in length by 28 inches in diameter. Eight feet rolls are counted large in most iron mills. There is also a large planing machine where a slab of iron 33 feet long can be finished. The Lairds are accustomed to have five or six vessels on hand at

Messrs. Napier & Sons have an establishment on the Clyde, where they are now building three ironclads for the Turkish Government.

Messrs. John Rogerson & Co. have a shippard at Newcastle-upon-Tyne, and rolling mills at Consett, 13 miles distant. These mills are the most extensive in England, turning out bar and plate iron. In the shippard eleven vessels have been seen under construction at once. At the STEEL SHIP-BUILDING YARD.

of Messrs. Jones, Quiggin & Co., at Liverpool, ships built entirely of steel are constructed. Frames, plates, masts, yards, standing rigging, all being made of cast or rolled steel, or steel wire. This firm was the first to adopt steel in place of iron for ships, and their success may be seen from the fact that five steel paddle-wheel steamers may be frequently seen on their stocks at once. They also build vessels of iron or iron and wood.

We have not, in these few notices, given even a full list of the iron shipyards of Great Britian, but have merely glanced hurriolly at a tew, from which an idea of the magnitude and perfection of England's shipbuilding facilities may be gained. The yards on the Thames River turned out, in 1864, 117,000 tuns of iron vessels. Those on the Clyde are 33 in number, and launched, in 1863, 170 iron vessels, with an aggregate tunnage of 120,700 tuns. The production of other localities is as follows:—Mersey 80,000 tuns; Tyne, 51,236; Weir, 25,000 tuns; Tees, 15,000 tuns; which, with those vessels built at Belfast and Bristol, and other places, made an aggregate of 500,000 tuns of iron vessels built in Great Britain in 1864.

THE STEAM ENGINE MANUFACTORIES.

Chief of these is the great manufactory of John Penn & Sons, who stand at the head of their trade. as do the Mill Wall Company at the head of the iron shipbuilding. The works were begun by Mr. John Penn in the early part of this century, and in 1830 the manufacture of steam engines was commenced. The establishment was without especial reputation till 1840, when the use of the screw propeller was decided upon by the Admiralty for the British navy. Engine-makers were invited to serd designs for a direct-acting engine, and Messrs. Penn & Son furnished the design of the engine now known as the "trunk engine," in which all parts are below the water line and capable of running at the high rate of speed required for propeller engines. It was approved, and a contract given for two engines for the Arrogant and Encounter.

These engines have now been supplied to no less than one hundred and thirty vessels in the royal navy, including seven of the largest British iron-clads. The navies of Italy and Spain are almost exclusively furnished with this class of engine. The design of Messrs. Penn & Son is said to be inferior in some points, but they have so often duplicated it, and have taken such pains with the workmanship, altering the troublesome parts when possible, that its effects may have been partially remedied. The works of this company are founderies and smithery at Greenwich, and a boiler manufacture at Deptford. The foundery is very old, and its appointments are antiquated. But such is the value of good superintendence and determined energy, that a competent witness testifies to the large castings made here, as possessing soundness, smoothness and perfectness superior to any that ever came under his notice. The machine shops are well appointed with modern conveniences, and the boiler-shop is acknowledged to be the most perfect of its kind in Great Britian, which, of course, means the world. Among its peculiarities are machines for planing the edges of boiler plates previous to riveting, which is an exception to the rule in boiler making. Other manufacturers of steam machinery of the largest class are: Messrs. Maudslay & Son, Messrs Humpbrey & Tennant, and Messrs. G. Rennie & Son. The description we have given of Messrs. Penn & Son's establishment will suffice for all, as our design is principally to convey an idea of the magnitude of the British works for building and maintaining a This brings us to the third division of our sub-

ARMOR PLATES

tor the British Navy are produced at the works of the Mill Wall, Thames, Cyclops, Mersey, Park Head, and Park Gate Companies, all of whom compete for the government contracts. We will describe the works of J. Brown & Co., the largest manufacturers of armor plates in the kingdom; and first we will look at the process of manufacturing the massive slabs of fron which cover the sides of British iron-clads. The first plates ever made in England to protect a ship's sides from an enemy's shot were made during the Crimean war, by the Park Gate Company, at their works near Rotterham. They were four inches thick. but of snall dimensions to those now in common use, The first sea-going iron-clad built, was the Warrior, armed with hammered plates,  $4\frac{1}{2}$  inches thick. Hammered plates were soon discarded in favor of rolled; and, as the result of experience, the following process of manufacture has been decided upon:—

Bars of about twelve inches wide and one inch thick are first rolled; five of these are then piled on each other, and rolled into a rough slab; two of these slabs are rolled into a plate; four of these plates are rolled into another plate; and finally four of these plates are piled and rolled into a finished plate. The last plate thus contains 160 of the first plates. The iron is heated to a white heat for each rolling, the object of so many successive workings being to produce perfect homogeneity in the mass. In very thick plates the piling is carried still further. In ordinary five or six-inch plates, the thickness of one of the original inch plates is one thirty-second of an inch, or one twenty-seventh of an inch in the finished plate.

THE PROCESS OF ROLLING

is well worth seeing. The plates are heated in a reverberatory furnace, so called because the slabs of metal are placed in a chamber filled with flame, but in which they are not in contact with the coals. Twenty minutes, half an hour, or an hour, according to the size of the plates, suffices to raise them to a white heat. On looking through a little aperture in the furnace, as soon as the eye is accustomed to the intense glow of the iron and flame, the mass of metal may be seen, wearing a soft, waxy appearance, and looking too purely white to give a sense of heat. Drops of scoria or impurities may be seen running in vivid streams down the surface, and falling on the floor of the oven, which, being inclined, they run off inio the "throat" of the furnace, and are removed. Workmen draw the mass with heavy hooks, on to an iron carriage, and it is wheeled to the rollers and its end presented to them. The swittly-revolving cylinders seize the glowing mass, and, with a tremendous hug, pull it between them. Troughs of water are hung over the rollers, and streams of liquid pour down on them. Clouds of steam rise as fire meets water, and make the work and workmen appear more Vulcan-like than ever. The process is repeated until the plate is the required thickness. Its edges are then trimmed according to pattern, in a planing machine, and, when it is placed in position on the side of the vessel, it fits its appointed place, as a glove fits the hand.

THE ROLLING MILLS

of England, capable of turning out armor plates, are six in number, and have been mentioned above. The works of Messrs. J. Brown & Co. are the largest, and their size may be estimated by the following condensation of the statistics of their works:-Area of the principal works, 18 acres; workmen employed, 3,024; quantity of coal consumed each week, 3,600 tuns. There are 60 puddling furnaces (furnaces for manufacturing scraps of old iron into bars), 42 steam-hammers, the drop of the largest being 8 feet with a weight of 20 tuns, and an anvil block weighing 161 tuns; the second size hammers are 12 tuns, and from this they descend to the smallest size. There are four sets of armor-plate rolls, two preparatory and two finishing. The ordinary size of armor plates is 15 feet long by 4 feet wide and 5 or 6 inches thick. But Messrs. Brown can roll larger plates than any other firm in the world. They lately made some for a Russian fortification 14 by 6 feet and 131 inches thick, and others 71 inches thick, 4 feet wide, and from 24 to 34 feet long.

The Mersey Steel and Iron Works, at Liverpool, are another very large firm. They work 11 steam hammers, from 15 tuns down. They possess an immense planing machine, having a traveling table 40 feet long, and two lathes of similar colossal proportions, being adapted to take in shafts 65 feet long. The works are also furnished with a steam traveling crane, with engine and boiler attached, which travels on rails laid down on the ground, picking up and transporting heavy work.

OTHER MACHINE AND TOOL MANUFACTORIES.

Besides these great establishments for the fabrication of ships and everything pertaining to them, the famous establishments of Sir William Armstrong, at Newcastle-upon-Type, and of Messrs. J. Whitworth & Co., at Manchester, are worthy of attention. The heads of these two establishments, Sir W. Armstrong and Mr. Whitworth, are well known to the world as of t play inch it as TI port Amo

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Th ducti It is take all; men of high scientific attainment, and the works under their management present a perfection of plan and an elaboration of mechanical appliances not to be found in any other similar manufactories in the world. The foundery in the Elswick Works (Sir W. Armstrong's) is regarded as the most perfect in Europe. The cranes for lifting heavy work are operated solely by hydrostatic power, and a boy stationed at a lever controls their action perfectly. Another remarkable peculiarity is the large steam hammer, weighing 10 tuns, but which, by having the steam admitted over the piston, can give a blow of 65 tuns, the heaviest of any in use in Europe, except perhaps, at the great steel works of Herr Krupp, in Russia. Under this ponderous instrument the famous Armstrong guns are welded. Experiments were some time since made here with the object of heating iron by gas, which would prevent the deleterious ac tion of sulphur, always contained in coal. The subject is an important one, but we don't know the result of the trials.

The establishment of Messrs. Whitworth is, par excellence, the tool factory of Europe. The machinery is of the best description, and contains many peculiar and very ingenious tools invented by Mr. Whitworth or his workmen. The guns of this celebrated mechanician now rival closely those of Sir William Armstrog, and a long series of trials have closed in almost a "dead heat."

### THE FAIR OF THE AMERICAN INSTITUTE.

On revisiting the Fair, this week, we found many things worth looking at, some of which we shall give a brief notice of.

APPARATUS FOR THE RUSSIAN TELEGRAPH.

In the southwest corner of the building may be seen a sample of the instruments that are to be used by the Collins Russian telegraph line, 75 sets of which have been manufactured in this ciry. The instruments are fixed in a box, which is quickly converted into a table by screwing on the four legs at the corners. For transportation, two of the boxes are fastened together in one package; and when these reach the station the operator bas merely to screw on the legs and connect the proper wires with the air and ground lines, when he is ready to receive and transmit messages. The manufacturers expect orders for an additional supply of these instruments, as some 200 or 300 will be required for the whole line.

### BESSEMER STEEL.

Messrs. Winslow, Griswold & Holley, of Troy, N. Y., exhibit Bessemer steel in various forms—in rails, cross heads, connecting rods for marine engines, boiler plates with flanges turned to show the endurance of the metal, crank pins, bolts with knots tied in them; in fact, all conceivable shapes.

This steel is exceedingly fine-grained in texture, and closely approaches the finest cast steel known to general machine work. A chipping chisel made from it was tried by us, and stood very well, although it is not recommended for tools. The flanged boiler plate has the advantage of being much lighter for the same strength of boiler, and also a greater facility for the transmission of heat, by reason of its thinness. Some of the specimens of flange turning were not only interesting as examples of the quality of the metal, but also for the good workmanship displayed. One three-sided aperture, about twelve inches long on each angle, had a flange turned around it as neatly and as square as if cast in a flask.

This steel will effect a great revolution in the proportions and weight of machines if properly applied. Among other curious examples of its toughness and tenacity a car axle bent double, cold, is shown.

### GAYLORD'S COUPLING.

The American Coupling Co. exhibit a neat and useful coupling for hose or pipe, which can be connected or detached in a few seconds. It is perfectly airtight, is used on steam or water, and is highly appreciated by those who use it. No. 33 Dey street, New York.

### BEACH'S DRILL CHUCK.

This is one of those instruments which the introduction of twist drills has rendered indispensable. It is a highly-finished tool, is made of steel, and will take any-sized drill, from three-eighths to nothing at all; one of them will last a life time. It has three

steel jaws in it, which move to and from the center by being forced against inclined planes by a screw in the end. By catching hold of the chuck as it revolves, the jaws can be screwed tightly so as to hold against any common work. An engraving of this chuck is all ready for publication in the SCIENTIFIC AMERICAN. All sizes, from five-eighths to threesixteenths, made by Clark Brothers, West Meriden, Conn.

#### WEBSTER'S WRENCH.

This is a most convenient little instrument. It is an ordinary screw wrench, with a socket outside the lower jaw. A tool fits this square socket, and is fed up by screwing on the nut that ordinarily changes the size of the wrench. For cutting off gas pipe, holding a round bolt, or screwing up pipe, it is just the thing. The wide range this tool has gives it a great advantage over the ordinary pipe tongs. The wrenches are made purposely for the admission of the patentable portion. Webster & Co., No. 17 Dey street. New York.

### MURDOCH'S STAVE SAWER.

This machine is on exhibition at the Fair, and saws two staves at once, by a saw arranged like a crown gear, except that the teeth are on the lower side. The saw runs horizontally, and seems capable of doing excellent work. The saw also acts as a plane, and leaves a neat fluish on the stave.

### ART ROOM.

The display of art works is not very extensive. There are a few paintings, but none of distinguished excellence.

The show of photographic pictures is meager, but the specimens furnished are for the most part good. Rockwood & Co. present some very fine and large architectural and mechanical views. Their prints of locomotives are superb.

Williamson, of Brooklyn, shows some excellent life-size portraits.

Gurney & Son exhibit a variety of excellent portrait specimens, among which is a splendid group of military officers—Gen. Dix and others.

Gutenkunst, of Philadelphia, has a fine collection of card portraits of marked superiority, with specimens of porcelain pictures that are truly beautiful. A splendid picture of Gen. Grant graces this collection.

S. A. Holmes, of New York, exhibits a fine collection of large out-door views—public buildings, Niagara, Central Park, and a series of oil-region pictures. All the mysteries of boring, pumping and tanking petroleum are here to be seen in perfection.

Messrs. Anthony present a number of fine Worthleytype prints. This process has been lately patented in the United States. The paper is covered with collodion containing salts of uranium and silver, and then printed. We have before fully described the process.

### ROTATING BELLS.

Mr. Harrison, of the American Bell Co., has a number of their composition bells, with his attachment for causing them to rotate as they are swung. The bell is hung loosely upon a round bolt, which is surrounded by a spur wheel made fast to the bell; this wheel communicates by a simple train of gears to a lever on one side, which is actuated by a cam as the bell swings, and which turns the gears by means of a pawl and ratchet wheel. The object of rotating the bell is to prevent it from being broken by the continuous pounding of the tongue in one place. Mr. Harrison says that this is the most common cause of the cracking of bells, and that giving them a very slow rotation prolongs their durability indefinitely.

### THE AMERICAN BARREL MACHINE.

This company exhibit some barrels, made by their patent machinery, which are very handsome specimens of workmarship. The machines consist of an apparatus for compressing the stave so that it takes a permanent "set" in the shape desired, and also in another machine, whereby the staves are jointed and finished. The barrels are subsequently set up by hand. Flour barrels made by this process are very tight. We were informed that, of a mixed shipment of flour to Cuba, in hand and machine-made barrels, the former were subjected to six or eight cents reclamation for short weight, while the machine-made barrels lost nothing. Thomas Richardson, No. 68 Broadway, is the agent.

#### IMPROVED ELECTRO-MAGNET.

Samuel F. Day, of Ballston Spa, New York, exhibits an electro-magnet, which he claims to be an improvement over any at present in use. Mr. Day has made hundreds of experiments with various forms of electro-magnets, and he says these have led to the discovery that the nature and action of the residual magnetism remaining, after breaking the circuit, is modified by the proportions of the magnet; in long and slender spools the scope of its power extends much further from the pole than in short thick spools. As the armature must be adjusted beyond the reach of the residual magnetism, any arrangement by which the power of this is circumscribed, is of great service in operating a telegraph. Mr. Day, therefore, makes his spools very short and of large diameter, the exact proportions having been determined by his numerous experiments.

### A CHÈAP FRUIT CUP.

J. F. Whitney & Son, of Milton, Ulster Co., N. Y., exhibit a fruit box, which they sell at \$20 per thousand—two cents apiece. It is made of a wooden splint, bent in a hoop and riveted, with a wooden bottom fastened by brads.

#### FOREIGN SUMMARY.

Dr. Ponowski, of St. Petersburg, proposes powdered hellebore (veratrum album), as a remedy for the cholera; it is to be taken by the nose, like snuff. This is an infallible remedy when the patient sneezes eight or ten times after a pinch; but if the patient does not sneeze his case is altogether hopeless.

THE effluvia which escapes from sewers, in the very attempt to ventilate them, are of a very pernicious character, and have often been productive of mischievous effects. M. Robinet, a French chemist, has devised a very effective means of freeing the sewers from them. His plan has already been carried out on a small scale. He proposes that the furnaces of factories shall derive their supply of air from the sewers: the latter will thus be emptied of their mephitic gases, which will be destroyed by combustion, fresh air from the atmosphere supplying their place. culates that if the combustion of only 70,000 tuns of coal can be thus economized annually in Paris, or only one-tenth part of what is burned there, the sewers will be supplied with about 140,000,000 cubic feet of fresh sir-that is more than seven times their contents-daily.

Ir is said that the impression produced on the officers of the British fleet during their late visit to Cherbourg, is that the iron shops at Portsmouth might be contained within the smallest basin in the Cherbourg docks, while the building, refitting and repairing works of the French iron marine occupy a space of many acres. It is evident that large establishments for iron ship building must, for the future, assume the most prominent position in British naval dockyards.

From Berlin we learn of the death of Astronomer Enke, whose name will ever attach to the comet he described and traced through its recurrent orbit; while other important additions to our knowledge of the firmament secure him immortality.

At the mineral works of MM Perret, of Lyons, on emptying an old cistern which had for some time been filled with water charged with sulphates of copper and iron, moderately thick coverings of metallic copper were found attached to the wood which had served to support the roof of the cistern, and among the stones forming its floor. The debris of the wood had doubtless acted by reduction on the cuprous solution. The reducing gases developed in the cistern had also acted.

The operation of fixing the 8-inch and 6-inch armor plates which will protect the reconnoitering tower on the upper deck of the Bellerophon has been commenced. The port and starboard portion of the tower will be protected by armor plates 8-inches in thickness, but as this portion will be of conical form, the chances of any hostile shot effecting any injury to it, although obviously more exposed than the other portions of the tower, are reduced to a minimum. All the 8-inch plates have stood the bending, slotting and planing processes to which they have been subpleted without exhibiting any flaw. The 8-inch plates are the largest yet operated upon at Chatham dockyard; but arrangements are now being com-

pleted for bending and working armor plates 8-inches in thickness, or double those of the thickness of the Warrior, with which the sides of the iron frigate Hercules, to be built at Chatham, are to be encased. Even this thickness of plating has been exceeded at the works of Messrs. John Brown & Co., Sheffield, where several thousand tuns of armor plates of no less than 131 inches in thickness have lately been manufactured for the Russian Government for encasing the sea face of the forts at Cronstadt.

THE capital expended in Great Britain on railways to the present time has been upward of three hundred and eighty-five millions sterling, or nearly half the national debt. This amount has been devoted to the construction of eleven thousand five hundred miles of railway in the British Islands, which are now open for traffic.

THE Directors of the British National Steam Navigation Company pay £1 a week to a rat-catcher for professional services on board the company's steamers. The rats, being fond of good living, are in the habit of migrating from ship to ship when they come into port, and as good living is plentiful on board the company's steamers, the rats patronize them extensively.

GREAT curiosity has been excited at Cherbourg by a small vessel propelled by electricity with great speed. The inventor, a French engineer, has shown his discovery to M. de Chasseloup-Laubat, the Minister of Marine. Another of the favorite scientific questions there has for some time been submarine

Another hot-air and steam engine has been invented by Huch & Windhauser, Germany. It is illustrated in the London Engineer of Sept. 8th.

## NOTES ON NEW DISCOVERIES AND NEW APPLI-CATIONS OF SCIENCE.

THE MECHANICAL EQUIVALENT OF LIGHT.

By a method, of which we shall give some account on another occasion, Professor Thomsen, of Copenhagen, has succeeded in ascertaining the mechanical equivalent of light. He finds that the mechanical equivalent of the luminous radiation, as distinct from the obscure radiation, from the flame of the French standard "bougie," is as nearly as possible 1.74 kilogrammeters per minute, being about one-fiftieth of the mechanical equivalent of the total radiation from the same flame. From this a writer in Cosmos has calculated the mechanical equivalent of the total light of the sun. He finds it to amount to something like that of 1,230 septillions of "bougies," or to thirtyfive billions of tuns litted a billion of kilometers per second-the lifting of thirty-five billions of tuns (French) a billion kilometers being about equal to lifting the weight of the earth twenty feet.

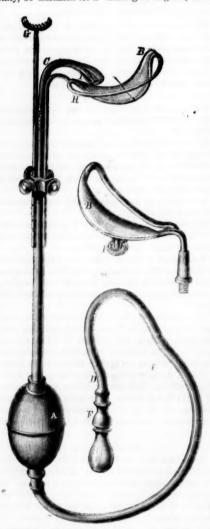
CHEAP METHOD OF ORTAINING CARRONIC ACID.

The Paris Societe d'Encouragement de l'Industrie has awarded its platinum medal to M. Ozonf, the celebrated manufacturer of seltzer water and soda water, for the simple and ingenious method by which he obtains pure carbonic acid gas with which to aerate those beverages. M. Ozonf burns coke in a furnace lined with refractory fire-clay, and supplies the furnace with sufficient air to effect complete combustion. The products of the combustion, consisting chiefly of carbonic acid gas and nitrogen, he first passes through water, in order to cool them, and, at the same time, to free them from mechanically admixed impurities, and then forces into the first of a row of receivers filled with solution of carbonate of soda. Except the last, which is open to the atmosphere, each of these receivers has a pipe passing from its upper part to the lower part of the next. The carbonate of sods in these receivers absorbs the carbonic acid contained in the gaseous mixture which is forced into them, becoming thereby converted into bicarbonate of soda, and the other elements of that mixture pass off from the last of the row of receivers into the air. When the solution of carbonate of soda with which the receivers were originally charged has become wholly converted into solution of bicorbonate, it is pumped into a boiler, in which it is heated by steam to 212° Fah., at which temperature the bicarbonate of soda gives off its second equivalent of carbonic acid, and is reconverted into ordinary or mono-carbonate. The carbonic acid so evolved is mixed with vapor of wa-

ter, but is, otherwise, perfectly pure, and the aqueous vapor, in association with which it leaves the boiler, can be readily separated by condensation. M. Ozonf effects this condensation by carrying through a reservoir of cold water the pipes which convey the gas from the boiler to the gas-holder. The solution of carbonate of soda left in the boiler is used to recharge the receivers. As the portion of carbonate of soda first used will thus serve over and over again, ad infinitum, no carbonate of soda being actually consumed in the process, the cost of the carbonic acid obtained by this method is very little more than that of the coke which supplies the carbon for itlabor and wear and tear being quite insignificant items. While, therefore, both simple and highly effective, M. Ozonf's process is also very cheap. Mechanics' Magazine.

### DIBBLE'S DENTAL APPARATUS.

The process of filling teeth cannot, by any possibility, be mistaken for a blessing in disguise, never-



theless it has to be endured by most persons at one period or another of life. Anything tending to shorten the time of boring, scraping, filing and similar delights will be gladly welcomed by the community at large, and also by the professional operator.

The apparatus here shown is intended to control the tongue or keep it out of the dentist's way, also to remove the saliva from the mouth as fast as it enters, so that it will not interfere with the progress or durability of the filling, and support the upper jaw, so as to render the operation less fatiguing. To secure these objects the inventor-who is an operating dentist, and may be supposed to know what is wanted -provides a pump, A, and a metallic plate, B. The pump is merely a hollow vessel of india-rubber connected to a pipe, C. There is a valve at E, and also one at F; the end of the tube, D, is deposited in a basin. The jaw is supported by the crutch-shaped rod, G. The apparatus is used in this way: The mouth of the patient being opened, the india-rubber

and secured at the proper hight. The tongue compresser, B, is then placed against that unruly member, so that it is held back out of the way; this action then brings the wire guard, H, against the cheek, 80 that it is pushed out also, and a fair opportunity given the dentist to proceed with all speed-the instruments being introduced between the guard and the tongue compresser, as shown by the arrows. The saliva that flows in the course of the operation is immediately removed from the reservoir, I, by compressing the india-rubber vessel or pump, A; this act draws it into the vessel through the pipe, C, from which it is expelled into the basin placed at the end of the tube. D.

The plate or tongue compresser, shown isolated fulfills the same office as the upper one, but is more compact in form, the two details being here combined

A patent is now pending on this instrument through the Scientific American Patent Agency by W. H. Dibble, D. S., of Bordentown, N. J.

### How the "Glasgow" Caught Fire.

Our readers may remember that the British steamer Glasgow was burned in a mysterious way a few miles off this port. The fire originated among the cotton. and was caused in the following manner. We take the account from Mitchell's London Shipping Jour nal:-

"The sounding well led from the steerage, and it would seem that, in stowing the cotton, it had been placed over the aperture, so that the carpenter could not get near enough to try the water in the ship. The boatswain's mate went forward with him for the purpose of removing the cotton. The two men got upon the bales and crawled twenty feet along the top of them. The carpenter then explained to the boatswain's mate what was needful to be done, and the carpenter, having reached the hole, had to remove some dunnage. To enable him to do this the other man held the lantern, and, on rising, the carpenter accidently knocked it out of the mate's hand. As it was falling, the carpenter tried to catch it, but, unfortunately the door of the lantern flew open, the lamp fell out, and the flame from the wick came in contact with the loose cotton, which instantly burst out into a flame. The casualty was, therefore, the result of pure accident. After this fearful disaster we should think that, in future, the lanterns allowed to be taken in the hold, or among inflammable cargo, will be secured inside the former either by screwing down, or by a bolt. If the lamp had not fallen out of the lantern, the flames could not have come in contact with the cotton. We may, therefore, charge the destruction of the ship to two of the petty officers going among the cargo with a lantern having a loose lamp in it, which fell out on the door of the lantern flying open."

## Sea-weed as an Insulator.

We understand that experiments have been made to test the value of sea-weed as utilized by M. Ghislin, of Hatton Garden, who gained the prize medal for manufactured articles made from this substance, and placed in the International Exhibition of 1862, and which it is now proposed to apply in the manufacture of the next Atlantic cable. Several specimens of a submarine cable made from this patented algaite have been tested by eminent scientific men, who have reported most favorably as to its merits. advantages are said to be that it is a perfect non-conductor of electricity; it readily combines and amalgamates with rubber, gutta-percha and other gums; it will resist the influence of salt water when other supposed non-conductors have lost their insulating powers, and that while the ocean destroys nearly everything submerged in it, sea-weed, being its natural offspring, is preserved by restoration to its native element. - Mechanics' Magazine.

A man in New Bedford has very nearly discovered a perpetual motion. Nothing seems wanting to complete success but the removal of a "hitch," that appears to prevent the machine from starting on its endless journey. We are not informed of the nature of the hitch, but we presume it cannot be of a very serious character, and, like the shareholders in the Atlantic cable, the inventor is sanguine that he will "fetch" it the next time.

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#### Platinum Glass Pots.

Messrs, Editors:-In your journal of this date there is an article on "Platinum Crucibles," by F. H. S., in which he says:—"If platinum crucibles can be made to stand heat and fluxes, at a reasonable price, and will last, on a guaranty, say four months, a large business can be done," etc.

Some twenty-five years ago I made some experiments with platinum, in hopes of making it available n the flint glass business (though not for crucibles or pots, as they are technically named); and I am therefore able to assure F. H. S. that it will stand the heat and fluxes with impunity, without diminution in size or weight, and would, if carefully used in dragading and scraping, last for years; but the first cost will be an insuperable barrier to the practical use of that metal for the purpose designated, for, at a rough calculation, the cost of platinum pots for a ten-pot flint furnace would not be less than \$500,000.

My experience teaches me that F. H. S. is unjust to manufacturers in insinuating that they "take so little interest in the scientific part of their art." I do not think there is any business that requires and receives a greater share of attention, or in which more money is expended in practical experiments, than in the flint glass business. He is, however, correct in his supposition "that they desire to keep the formalas secret," and, I opine, that if F. H. S. had devoted his time for years, and expended no inconsiderable amount of money, in chemical and practical experiments to improve the quality of his metal, that on his succeeding in doing so he would not be so apt to "contend there is no necessity for secresy."

The experiments of M. Pelouze have, doubtless, been on a diminutive scale, probably in a small experimental furnace. I always built my furnaces with proper tacilities for this purpose.

I imagine your correspondent is not acquainted with any other branch of the business than the hollow-ware trade, while there are five different and distinct branches, viz.: flint glass or crystal, plate glass, crown glass, broad or common window glass, and bottle or hollow-ware, requiring different styles of furnaces and shapes of pots, and an equally distinct class of workmen. The flint glass being the most beautiful and costly, and requiring the greatest amount of practical and scientific knowledge in the manufacture, and a great delicacy of manipulation on the part of the workmen to produce a perfect

In regard to the construction of furnaces, etc., the relative proportion of pots (crucibles) and furnaces must necessarily be somewhat varied, depending entirely on the nature of the fuel and the power of evolving caloric. I have myself used five different kinds of fuel, and have found it necessary to vary the size of the eye and the rise or spring of the cap or crown to suit the fuel. As to the best material for benches (as they are termed in the hollow-ware houses) or sieges (in the flint house), I cannot think there can be two opinions among men conversant with both branches of the business. I have known a clay seige, constructed with care, last fourteen years, while the same material, used for the benches of a hollow-ware furnace, would not, without entailing trouble and expense in repairs, last a single blast of ten months; this will be obvious to the initiated. But it would take up too much of your valuable space to even cursorily enter into details at a greater length upon the various points mentioned by your correspondent; they could be better treated of, be of more use to inquirers, and certainly more interesting and entertaining to your readers, it systematically arranged in the form of a series of articles on glass making. W. H.

Bordentown, N. J., Sept. 9, 1865.

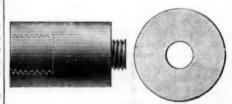
## Chuck to Hold Sheet Metal, Etc.

Messes. Editors:-To turn a thin piece of sheet brass circular, and then to mill its edge, requires time and skill; first, to fasten the uneven piece of brass plate to a wooden chuck by means of screws,

fasten that disk between points, and a center, to hold it true and firm during the time needed to mill its edge. Unless great care be taken, the sheet bars will be indented by the points and the center-point. To obviate these difficulties, I adopt a very simple and quick mode of fastening the metal plate to a chuck.

Some of your readers may suggest that the plate could be secured by shellac or cement. This plan is the true principle, but the slightest blow would detach the plate and spoil the work. If, however, you use solder as a cement, the adhesion is perfect; and by the following plan, in a few minutes, the plate can be fixed so firmly to the chuck that no blow or jar will affect it.

As I have found old hands at the lathe entirely ignorant of the process of soft soldering, and as I have labored for years under the same disadvantage, it may interest some of your young subscribers to know how to attach two pieces of metal in a few seconds. This is effected by placing on each piece, with a leather or small brush, a small quantity of muriate of zinc, and then holding each piece over a spirit lamp-taking care not to inhale the formerand when it boils rub the plate with a thin stick of pure tin or soldier; I prefer tin, which I melt in a ladle, throw out, with a jerk, on a metal or stone slab, so as to form a sheet when cold, and then cut into strips a little larger than an ordinary match; I, however, prefer drawing the tin into wire, of different thicknesses, and using it in that state. Any one can make the muriate of zinc by filling an ale glass onethird full with muriatic acid, and adding pieces of zinc (in the open air) until it will dissolve no more, then pour it off clear. As an experiment for the learner, let him heat a cent by a spirit lamp, placing a drop of muriate of zinc on it, and then rubbing a small quantity of tin on it, while the cent is held by a pair of pincers; then take a copper tack, dip the head in muriate of zinc, and place the head on the middle of the cent, which is still held by the pincers over the lamp; in an instant the head of the tack will become turned, and when both are cool press it with the foot into the floor. The first person who sees the cent on the floor will try te pick it up, and he will enjoy a laugh at the other's expense, and, at the same time, have taken the first lesson in soldering.



But to return to my chuck, which I call my "solder chuck." It would answer to heat any thin brass chuck and tin its face, then to heat the sheet brass you wish to turn round, and to tin it also; placing the two tinned surfaces together, you heat them and let them get cool, with a weight pressing them together until cold; but this would consume too much time and alcohol. I, therefore, make my chucks, of brass or iron, with a steel male screw, projecting not quite one-fourth of an inch beyond the face of the chucks.

I make several washers of brass, one-fourth inch thick, and tap them so that they screw acccurately on to the male screw: they are of different diameters. to support smaller or larger pieces of brass plate, according to the diameter of sizes I may wish to turn. One side of these washers I tin by the process before described. I now take a piece of sheet brass (square or any other shape) mark the center with a point; then I tin, as before described, a place about as large as the washer to be used; then I place the tinned side of the washer on the sheet brass, in the center, which you see through the hole in the washer; let the whole be heated over a spirit lamp, and cooled, and this operation-which will only take a minute or two-fastens the sheet brass to the washer perfectly, and you now can screw the washer on to the chuck. You can thus turn the sheet brass round with perfect accuracy, and mill its edge, if you choose, as our silver coin was formerly milled on the edge, and in order to turn a circular disk; and, secondly, to then if you wish to form the bottom or top of a metal spent upon it, every summer. This summer, remem-

box you can turn a groove to receive the body of the box. To disconnect the finished disk from the washer you heat it over the lamp and separate the two while hot, rub off most of the tin with a piece of newspaper, and, when cold, the rest of it with sand paper. I have before me a flat, round, brass match box, made in this way; grooves were turned in the top and bottom disks, and short pieces of brass pipe were soldered into the grooves in the same way as above described: the bottom was turned with eccentric circles to strike the match on, and the top ornamented with looped figures by an elliptical cutter: the box was then bronzed-it might have been plated or gilted.

The above description illustrates only one kind of "solder chuck" for turners. It will suggest, however, a variety of other plans for attaching work to be turned by the adhesive properties of solder. For instance, when I wish to turn steel "in the air" with great accuracy, I bore a hole into a brass chuck to receive one end of a bar of steel, which I solder into it, and thus avoid the possibility of shaking so usual in universal or die chucks.

E. J. W.

Lenox, Mass.

### Cement for Aquaria.

MESSRS. EDITORS:-I would be obliged, and, no doubt, others of your readers, if you would give us the proper quantities of glue, rosin, oil and whiting required for a good composition to ornament frames or other inside decoration. I find by putting them in by chance they are apt to crack up and cost much labor to refix.

I have seen for years many inquiries in your paper for a good cement for aquariums. I have tried fifty different ones, and find the best composition is, one part common pitch, one-half part gutta-percha; they can be melted in a little turpentine. To make it work easier. there must be no coal oil in the turpentine, or the pitch will soften and be destroyed; a rascally druggist made me lose several dollars' worth of gutta-percha in that way. You will find this mixture gives a little with the material that the tank is made of, as the changes of heat and cold affect it; and it will adhere to glass, wood or iron. E. BRUCE.

St. Louis, Mo., July 30, 1865.

[The proportions are one pound glue, one-half pound linseed oil, two pounds whiting. Stir well while melting, and let it cool gradually on a stone covered with powdered whiting; heat it well again until it is tough and firm; cover with a damp cloth when not in use.-EDS.

### Perfumers.

MESSRS. EDITORS:-Most all of your readers have een the neat little article used to blow perfume in a handkerchief; it is composed of two pieces of tube glass, and when one is inserted in a bottle, and the other piece is blown through, the perfume rises in the tube, and is blown off in a delightful spray. What I wish is, that you will explain the philosophy of the thing. Why does the fluid rise in the main tube? Is it caused by the current of air passing at right angles with the main tube? Or how, then?

[The explanation is simply friction. When a current is moving through any fluid the particles on the outside of the current rub against those of the fluid, and carry along a portion of them, thus creating in the fluid a current in the same direction. When the vertical limb of a T-shaped tube is inserted in a liquid, and a current of air is blown through the horizontal limb, the air is swept out of the vertical limb by this rubbing or dragging action, and the liquid is then pressed upward into the tube by the weight of the atmosphere resting upon the surface outside of the -Eps.

### Petroleum for Worms.

MESSRS. EDITORS:-I read your abstract of the debates of the Farmers' Club with much interest, but have not yet seen it stated that coal oil, such as is used for lamps, will destroy tree worms, and the common yellow caterpillar and the measure worm. With us these vermin appear some three weeks earlier than with you, and may then still be dosed.

I have a plum tree some dozen years old-a bearing tree-in my yard, that has been regularly attacked and the verdure destroyed, unless much time was

bering how effectually my people extirpate vermin from the house, I took my fishing rod, with a rag of the bulk of an egg tied upon the tip, and attacked them. I saturated the rag two or three times, and used it as many, touching under and upon the nests wherever I could, and not very thoroughly either. The leaves that had been attacked by the worms died and dried up; this was evidence of cessation of their work. In a week new leaves appeared under the still standing web, but there were no more signs of worms. A second crop, being another batch, appeared in a month or six weeks, and were as easily disposed of, and none have since appeared. I believe this to be a thorough and good remedy. Those worms that it touches I know it kills, and such as get a smell of it leave at once, perhaps die.

R. H. A.

Baltimore, Sept. 9, 1865.

#### An Electric Circuit.

MESSES. EDITORS:-In a late number of the Sci-ENTIFIC AMERICAN there appears an article stating the manner in which the defect in the Atlantic cable was located. From the language used it appeared that the current sent out on the wire from Valentia passed off at the bit of wire, and the ocean then served as a conductor to carry the current back to the coast of Ireland-forming what electricians term a "circuit." Do I understand that, to form a circuit, the current must return to the same point from which it started? and, if so, why would not the current that passed off the wire at the place the bit of wire ran through the outside covering of the cable, as likely cut across through the ocean to the American coast as to return to the coast of Ireland? Or, in other words, explain the word "circuit" as employed by electricians. SCHSCRIBER.

Paterson, N. J., Sept. 13, 1865.

[If you pour some dilute sulphuric acid into a glass cup, and place a plate of copper in the cup on one side, and a plate of zinc on the other, so long as the metal plates are not brought in contact or connection no action takes place; but if a metal wire or other conductor of electricity is stretched from the copper to the zinc outside of the liquid, a current of electricity immediately starts from the zinc, passes through the liquid to the copper, and from the copper along the wire to the zinc, thus flowing in a perpetual circuit. Instead of leading the vire directly from the zinc to the copper, it may be led from the zinc into the earth, and from the copper into the earth, when the current will flow the same as through a direct connection. The reason why the current should go to Valentia was, that the cable was connected with one plate of the battery, and the other plate was connected with the ground at Valentia. The mode of connecting the wire with the ground is by soldering it to a broad copper plate, and burying the plate in moist earth. In cities an easier and more effectual method is to connect the wire with gas or wates pipes. At some of the stations on the line of the California telegraph, in the Great American Desert, the ground is so dry that it acts as an insulator, and no conducting connection with the earth can be made. It was at first supposed that the ground acted precisely the same as the portion of wire which it displaced, and that the current of electricity darted along through water, gravel and rocks from the end of the wire connected with the copper plate to the end of that connected with the zinc plate; but it is now regarded as settled that the earth is a great reservoir of electricity, into which the current flows from the end of the one wire and from which it is drawn into the end of the other.-EDS.

### Action and Reaction.

Messes. Editors:-There is, I believe, an important law of mechanics, never, as yet, definitely announced, and, so far as I am aware, lying unknown, because a current form of words, true in their application to a different case, is supposed to cover vastly more than their author ever intended. In this I allude to action and reaction in a mechanical sense, as distinct from the same when considered as an element of statics. Since Newton announced as a law of statics that action and reaction were equal and in opposite directions, the law has, with unquestioning credulity, been extended to another science as different from that of which this simple law forms the chief regard as any evidence whatever. - EDS.

part as two sciences in the least akin can ever be. Statics, as is well understood, treats of pressures alone, or of the intensity of forces, which is the same thing, while the science of mechanics considers forces with reference to their quantities. The law of statics referred to can, therefore, only mean that from every exertion of power the pressures produced in opposite directions are equal. But when we come to speak of mechanical action and reaction the question is what is the quantity of force consumed respectively by action and reaction. A mechanical force being always estimated by multiplying its intensity into the distance through which it moves, and, the intensity being always equal in opposite directions, it follows that the quantities of force expended in each of the two ways are to each other exactly as the distances acted through in the different directions; or, in other words, as the respective lengths of the forces. Assuming this as probably clear to every one, we have now but to inquire for the law which governs the distances moved through by different bodies in the same time when acted on by equal pressures. But it is a matter of every-day observation that this is proportionate to the intensity of resistance which they offer. The deduction from this is so clear that it might be made by any one, viz-that, in a mechanical sense, action and reaction are in opposite directions, and in quantity inversely as the intensity of the resistance in their respective directions. And this is a law verified by so large a number of instances that none can have failed to observe them, rendering a present induction of facts ISAAC E. CRAIG. unnecessary.

Cleveland, Ohio, Sept. 16, 1865.

Prot. Treadwell has published a pamphlet discussing this problem at length and coming to the same conclusion as our correspondent.-EDS.

### To Preserve the Evesight.

MESSRS. EDITORS:-It may be well known, perhaps, by many of your readers, if not all, that, as a person grows old, the eye loses its convexity or the pupil becomes flattened. For this reason near-sighted people, whose eyes are too convex, often experience an improvement in their evesight as they grow old, for the reason mentioned above. If all persons who are not near-sighted should, every time they wash their faces, press their eyes outward, or try to make them as round as they can, taking care not to press or flatten the pupil of the eye, their eyesight would be improved. In this manner I have improved my eyesight, which showed signs of decay. Another theory, almost as important-avoid rubbing the eye when it itches, for in this way the eye is not only iuflamed but often flattened. When the eye feels tired vet your finger with spittle and rub it around the lids, this will cure inflammation; and, next, avoid coming from the dark to light, or light to dark; and never read much in a cloudy day or look long sideways.

[Many years ago we heard this same direction for preserving the eyesight, and, being then very young, we accepted it without questioning; but every year of our observation of men brings some new evidence to strengthen our distrust of human testimony-not from the disposition of people to tell falsehoods, but from their carelessness of observation. When the French tourist saw a Dutchman recover from a fever atter eating boiled cabbage, he entered in his journal: Boiled cabbage will cure fever;" when, however, he saw the same remedy followed by death in the case of one of his own countrymen, he modified his conclusion, and made a new entry in his journal: "Boiled cabbage will cure a Dutchman of a fever and kill a Frenchman.'

Men recover from disease without using any remedy; they doubtless frequently recover in spite of injurious remedies employed. Many persons never have occasion to use spectacles, though they tollow no special method in washing or rubbing their We know of no reason why the plan proposed by our correspondent should not be perfectly effectual; we only want satisfactory evidence to be lieve that it is so; but one or two cases, observed in the careless manner which is common with most people, and not compared with the numbers of cases in which the plan was not pursued, we should hardly UP IN A BALLOON.

At the junction of Sixth avenue and Fifty-ninth street, in this city—just by the southern boundary of the Central Park-there is a vacant lot, which has been rented by the well-known aeronaut, T. F. C. Lowe, for the purpose of giving any person who may desire it, a balloon ascent to the hight of a thousand feet. The lot is inclosed by a board fence, and twenty-five cents is charged for admission, the sum of five dollars being charged for each ascent; the balloon carrying up two at a time, beside the aeronaut, who accompanies them-thus making the charge two and a half dollars for each person. The balloon is held by a rope an inch in diameter and 1,200 feet in length, which is passed under a pulley and wound around a large drum, 16 feet in diameter. During the ascent the revolutions of the drum are held in check by two men with levers acting as brakes. The balloon is drawn down after an ascent, by turning the drum-a horse being at present employed for this service, though it is designed to use a steam engine. As a measure of precaution, a second rope is attached to the balloon, and this is let out and drawn in by hand. The balloon is about 40 feet in diameter, and holds about 25,000 cubic feet of gas. Its buoyant power is estimated at about 1,500 pounds, though it is the practice to take up only two persons at a time beside the aeronaut.

In the still bright forenoon of September 20th, two of "us" took our seats in the basket, some bags of sand were lifted out, the stout rope that fastened the balloon to the earth was unhooked, the word "All right!" was given, and we were lifted easily and swiftly upward into the air. In accounts of balloon ascensions it is usually stated that the sensation is that the balloon remains stationary while the earth sinks away beneath it; but this is not the case in this kind of attached ascent. The earth seems to stand as tirm as ever, while we are the movable things that feel ourselves borne gently upward to a hight in the air, compared with which the climbing of Trinity church spire, or Bunker Hill Monument, is contemptible. Though both extremely sensitive in this respect, no giddiness was experienced-the stout rope netting around the basket making a tumble-out manifestly impossible. We were, therefore, able to enjoy the novel experience with unalloyed satisfaction and pleasure.

There is, perhaps, no spot on the earth better fitted for such ascents than the one selected by Mr. Lowe. On one hand is the Central Park, with its serpentine roads, green lawns, and bright lakes and reservoirs; and on the other, the great city, with its long parallel avenues and cross streets, with its cars and omnibuses looking like crawling turtles, and its Liliputian men and horses moving about so far beneath us. The geography of the city and its environs is displayed with remarkable distinctness; the North and East rivers, the islands of the harbor, the towns and vil lages all about, with embracing woods beyond-are shown in the double clearness of a combined map and landscape view. After gazing our fill upon the scene from our airy hight, we inform our attendant aeronaut that we are ready to descend, he blows a shrill whistle, the horse commences his circling journeys around the whim, and we are drawn quite rapidly down to the surface of the earth again. The descent occupies about five minutes; the ascent a little

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The whole thing is admirably managed, and nothing could be more agreeable and satisfactory in every respect. Mr. Lowe informs us that more ladies than gentlemen have improved this extraordinary opportunity to make a short aerial journey.

### Submarine Cables.

In Europe, Asia, Africa, and Australia there are 52 submarine cables, which are of the aggregate length of 5,625 miles, and the insulated wires of which measure 9,783 miles. The longest of these is 1,550 fathoms, and the shortest 11 fathom. There are 95 submarine cables in the United States and British North America, which measure 68 miles, and their insulate wires 133 miles. The overland telegraph line between New York and the west coast of Ireland, through British Columbia, Northern Asia, and Russia, will be 20,479 miles long, 12,740 miles of which are complete. It has at length been resolved that this line shall cross from America to Asia at the sothern point of Norton Sound, on the American side, to St. Lawrence Island, and from thence to Cape Thadeus, on the Asiatic continent. Two submarine cables will be required for this, one 135 miles long, and the other 250 miles Cape Thadeus is 1,700 miles from the mouth of the Amoor River.

#### RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:

Device for Sifting Flour and Other Substances. This invention relates to a new and improved device for sitting flour and other substances for domestic use. The invention consists in the employment or use of a semi-spherical sieve, in connection with an oscillating frame provided with spheres or balls, all being arranged in such a manner as to insure the flour being sieved in a thorough manner, with the least possible labor, and without pulverizing, and forcing through foreign substances, as is frequently the case with other devices of this kind. It is a very economical and ornamental affair, and will, doubtless, be extensively used. James Myers, New York City, is the inventor.

Loom .- The object of this invention is a hand loom, in which both the motion of the harness and the shuttle motion depend upon the motion of the lay or batten. The harness motion is effected by an arm extending from the batten and connected by a pivot with a lever catch that acts upon a lanternshaped cam, mounted on the treadle shaft, in combination with suitable arms or tappets inserted in said treadle shaft, in such a manner that for each stroke of the batten a quarter revolution, more or less, is imparted to the treadle shaft, and the harness is changed by the action of the tappets on the treadles. The shuttle motion is effected by means of sliding blocks secured in each end of the batten, and operated each by a spring lever or driver, which is set automatically by the combined action of square disks, hook catches and cams, in such a manner that on each forward stroke of the batten a partial revolution is imparted to each of the square disks, and the driver on one end of the batten is set while that on the other end (having been set on the previous stroke) is liberated, and, by its action on the sliding block, connected to it, the shuttle is propelled to the opposite end of the batten. John Seaman and Wm. G. Henderson, Andover, N. Y., are the inventors.

Decarbonizing Retorts.-This invention consists in the employment of a current of air, either mixed with steam or without the same, for the purpose of decarbonizing retorts, particularly clay retorts, such as generally used for manufacturing illuminating gas, and for other purposes. Such retorts are liable to absorb a quantity of carbon, and a large quantity of carbon or soot adheres to their inner surface, particularly toward the back. If this soot or carbon is not removed, the retort becomes useless after a short time. Patented in the United States and Europe, through the Scientific American Patent Agency, by G. W. Edge, Jersey City, N. J.

Machine for Drilling Rocks, Etc.-This invention consists in the employment or use of a spiral lifter, in combination with a tappet extending from a sleeve fitted in the drill or drill rod, and with an arm extending from said sleeve in the cam slot, in such a manner that, by the action of the cam slot and arm, the tappet is held in contact with the thread of the feeder until it arrives at the end of the stroke, when the same, by a curve in the cam slot, is thrown out of contact with the feed screw, and the drill is allowed to drop, and, while being thrown out of gear with the feed screw, it is turned, causing it to strike a different spot on each stroke. By this arrangement two or more drills can be operated by means of the same lifter and by the same driving power. Robert Hood, Dayton Ohio, is the inventor.

Balanced Slide Valve.-This invention consists in a balanced slide valve for steam engines. The valve is placed in a cylindrical steam chest, which has two steam pipes, one near either end, each encircling about two-thirds of the steam chest, said pipes being in communication with the steam ports which lead into the opposite ends of the cylinder. Steam is admitted into the chest at one end, and, the valve or dent of success. The naval engineers complain that may be an economical fuel.—Eds. Sci. Am.

piston being hollow, it is allowed to pass through it into the other end, thereby providing for an equilibrium of pressure on both ends of the valve. C. W. Tremain, Memphis, Tenn, is the inventor.

Umbrella and Parasol.—The object of this inven-

tion is to connect the stick of an umbrella or parasol to the rib3 and their co-operative parts in such a way that the said parts shall be free to rotate on the stick instead of being fixed thereto, so that when the umbrella is extended and in use the part composing the cover will yield when it meets an opposing object, and will take a rotary motion on the stick, thereby relieving the hand and also the umbrella from strain. Wm. Damerel, Brooklyn, N. Y., is the inventor.

Gaiter Boot and Shoe .- This invention relates to a new and useful improvement in the lacing up arrangement of a gaiter boot or shoe, whereby the same is rendered water-proof from the bottom to the top; or, in other words, no seam or joint is allowed at the lacing for water to pass through, and the gaiter or shoe at the same time rendered capable of being applied to, and taken from, the foot, as readily as those of ordinary construction. Thomas Powell, Richland, Ind., is the inventor.

Machine for Dressing Minerals .- This invention relates more particularly to a machine especially adapted to the dressing of kaolin clay, so extensively used in the manufacture of porcelain ware, and also paper, and it principally consists in submitting the clay to the action of a current or currents of water within a series of one or more drags provided with flood gates, arranged so as to be opened and closed at pleasure, whereby the passage of the water with the clay through the drags can be regulated as may be necessary, and thus the separation or removal of all gritty substances from the clay accomplished—the pure kaolin being deposited by the water current in any suitable receiver or tank. from which it can be removed in any proper manner. By this machine the dressing of the clay is accomplished in a most satisfactory and expeditious manner, and, by duplicating some of the parts of the machine, a continuous operation can be maintained an advantage of much importance. Thomas Moore is the inventor, and has assigned his right to Joffu Ellerby, of No. 63 Pearl street, New York City.

Chair for Barbers, Dentists, Etc. - This invention consists in a novel construction of chair for the use of barbers and dentists; it comprises a stool and mirror, and the body of the chair is provided with receptacles for a supply of hot and cold water, implements of trade, washing apparatus, money drawer and other closets. The legs of the chair body are hinged so that they can be folded up, and the sides of the stool can be separated from each other and folded up, so that the whole apparatus can be packed in a small compass for transportation. Henry Remick. Portsmouth, N. H., is the inventor.

Alarm Lock -This invention relates to an alarm attachment for locks, and also to a key-hole guard for the same, whereby it is believed that a very simple and efficient means is provided against burglary. and also for giving an alarm whenever the slide latch of the lock is operated and a person opens the door. Jacob Euteneur, of Peoria, Ill., is the inventor.

Wind Wheel .- This invention relates to an im proved device for obtaining power from the wind, and it consists in the use of a wind wheel provided with a vane and shield, and with oblique fans or buckets, and arranged with a gate in such a manner that the speed of the wheel may be regulated as desired, and the wind made to act efficiently upon it. The invention also consists in a novel means for operating the gate and for stopping the wind wheel when required. John A. Hubbard, of West Houlton, Maine, is the inventor.

### THE NAVAL ENGINES.

Since the article on page 216 was written we have obtained some additional particulars. Without giving a detailed statement of the log of the two ves sels, which we have not room to publish at this late hour, suffice it to say that the Algonquin, at 8 o'clock on Sunday evening, had made 44,741 revolutions, burning 1,600 pounds of coal per hour, and carrying 70 pounds of steam, while the Winooski had made 44,718 revolutions on an average of 17 pounds of steam. The friends of the Algonquin are very confi-

the draft is very poor, and that it is hard to make steam. At 10 A.M., the 25th inst., the Algonquin was lying idle at the dock, while her opponent, the Winooski, was paddling away vigorously. The Algonquin stopped in consequence of a bursted feed pipe, and will resume as soon as her repairs are completed. It is impossible to avoid noticing the fact that the Algonquin-Mr. Dickerson's boat-has broken down several times in the course of the trial; as also, that the engine, when in operation, performed poorly in comparison with the vessel opposite. On two occasions the engine stopped, when hooked on, without the slightest warning, when the boilers had 70 lbs. of steam on and heavy fires in; the tubes have collapsed, and several minor casualties of less note have occurred. The Winooski's engines work beautifully, and between the times of the exhaust the clock can be heard ticking in the engine room. At the time when the Alyonquin ceased to work, the Winooski, as reported by the naval engineers, was 330 revolutions ahead of her.

#### A Locomotive Using Petroleum,

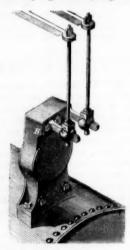
Mr. P. Hayes, of the Victorian Chemical Works. Footscray, Australia, has made another successful trial of his new invention for generating steam, from Williamstown to Melbourne. It was intended to have made a final test of his novel scheme by running a train a considerable distance on the Victorian line, for the purpose of ascertaining its carrying powers with loaded wagons, but his plans were thwarted by some unforeseen mismanagement on the part of the authorities. Mr. Hayes's discovery is the result of two years' close study, and is a new means of raising steam by oil in lieu of coal, which, it carried to a successful issue, will be attended with great economical and other advantages. The nature of the new process is to convey a hydro-carbon oil through heated retorts, to enable the gas to come in contact with hydrogen. This produces a large volume of smokeless flame, extremely pure and brilliant. It is unattended by anything of an explosive nature, and the heat therefrom is sufficient to produce steam as fast as coal or coke in an ordinary furnace. The only alteration made in the locomotive is the fixture, in that part of the tender in which the coal is usually deposited, of an iron cistern or tank, constructed to contain about 250 gallons of hydro-carbon oil. In order to permit of oscillation between the engine and tender, a small pipe, with a strong leathern joint, is carried from the tank to the bottom of the fire-box, where three small retorts are fastened in place of the ordinary bars. The oil runs into these, heat is applied underneath, and directly the gas begins to form, hydrogen is thrown in, by very simple means, and the contact creates the flame above alluded to, which, on passing through the tubes of the boiler, generates steam with surprising rapidity; and, instead of occupying two hours, as is customary by the old system, Mr. Hayes can, by his new process, get up steam in a locomotive with cold water, high pressure of 110 pounds, in the short space of three-quarters of an hour. The engine, as on previous occasions, was brought from Williamstown to Melbourne by Mr. Haughton, foreman engineer of the Government workshops at Williamstown, steam being on this occasion at 110 pounds. The gentleman speaks in very high terms of the new principle, and his opinion is supported by many of the railway officials. Mr. Hayes declares that his patent is applicable to any ordinary steam-engine boiler. Presuming the affair to turn out a success, the saving to the locomotive in many respects would be great, seeing that the oil is inexpensive, and can be obtained in large quantities; and, as applied to marine engines, the invention is most valuable from economy of space. Another great advantage is, that the money (which at the present time has to be transmitted to New South Wales for coals would be kept in Victoria, the ingredients with which steam is produced being derived from a mineral product which is found in inexhaustible quantities in this colony .- Melbourne Age.

[Instead of "hydrogen," it is probably either oxygen, or atmospheric air, that is thrown in to burn the vapor of petroleum. There is no difficulty in making steam with petroleum; the only objection is the expense. If, in Melbourne, a pound of petroleum does not cost more than a pound and a half of coal, it

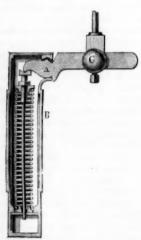
### CAMERER'S SAFETY-VALVE BALANCE.

" This simple and durably-constructed balance, illustrated in Figs. 1 and 2, was originally intended for locomotive engines, but can also, with great advantage, be used on marine engines, or any place where a dead weight is objectionable.

It is well known that a dead weight on a safetyvalve lever is the most desirable and safest, wherever it can be applied; but on locomotive boilers, which rest on springs, it cannot be used, as its action on the valve would be influenced by the vibrations continually occurring. On marine boilers, where weights are still in use, the rolling of the ship occasionally makes it necessary to lash the levers down until the weather moderates, thereby destroying the only virtue of the valve. Spring balances, as generally made,



are more or less objectionable, on account of the springs becoming stiffer as the valve rises. Various plans have been adopted to overcome the defect by regulating the strength of the springs. thereby depending on the vigilance of the engineer to prevent the pressure from getting too great; whereas, the balance here illustrated, requires no attention whatever when in use, as an increase over the allotted pressure cannot take



The arms, A A, can rise as much as the safety valves may require, without additional pressure, which makes this balance equal in efficiency to a dead An example will make the disadvantages of spring balances now in use more apparent. For instance, if a safety-valve lever is held down by a spring, the other end of which is fastened to the boiler or some other fixed point, the lever cannot rise without increase of power over and above the pressure it was calculated for; and if the proportions for length of lever are as 1 to 10, then the valve cannot be lifted one-eighth of an inch without raising the end of the lever ten times one-eighth, or 11 incheswhich distance is, on the ordinary spring balance, equal to 28 lbs.; and ten times 28, or 280 lbs., on the valve. Now, if we have a valve of 21 inches diameter, or 4.9 square inches area, the additional pressure would be 57 lbs. per square inch to lift said such circumstances it ceases to be reliable, and re- intendent of the Boston Public Library. He has in this paper on the 14th of February, 1863.

quires watching and regulating to avoid over-pressure or accident.

The advantages of this improved balance are in the peculiar lever arrangement, by which the above enumerated faults are avoided. The arms of the levers, A, inside of the casting, B (see Fig. 1), from the fulcrum to the springs, are at an angle with the outside arms; and an upward movement of these outside arms is accompanied by a corresponding downward, and also an inward movement, of the inside arms resting on the springs; therefore, the more the springs are compressed the shorter the effective length of the inside arms will be, thereby increasing the power of the outside arms in the same proportion as the springs get stiffer from compression, thus enabling them to rise the required distance without increase of power. The rod, C, is fastened by a set screw to any distance from the fulcrum, according to the pressure required. Close behind this rod a small pin can be put through the arm, to prevent the engineer from increasing the pressure beyond what the boiler was intended to carry; but as much of the arms as is not in the way of anything, may be allowed to protrude, for the purpose of decreasing the pressure, should any accident to the boiler make it desirable to do so. To keep up a uniform pressure of steam is considered far less injurious to a beiler than the sudden changes, produced by slacking or screwing down safety-valve levers. Such changes will not take place where the improved balance is used.

The springs are made of hard brass wire, expressly drawn for these balances, and are not liable to corrosion, as is the case with steel springs; and, being compressed when working, are far less liable to break or to lose their elasticity.

These balances have been in use for more than a year on several of our leading railroads, where they give entire satisfaction. Patented March 1, 1864. For further particulars address the inventor, Wm. Camerer, Reading Pa.

### NEW FORM FOR COINS.

We have seen a sample of a new plan tor coins, which consists in making them in the form of the numeral of the denomination which they represent. For example, the one, two, three, four and fivecent coins have the form, respectively, of the nu-

1, 2, 3, 4, 5.

This novel style for coins presents a handsome appearance, and as each piece has its own distinctive form, no confusion in the use can take place. This is more than can be said of the new three-cent coins now being issued by the Government, which are so much like the one-cent pieces that after a short time it is difficult to perceive the difference.

#### Preservation of Flowers with their Natural Colors.

Dried flowers, in their natural colors, have, for some time past, appeared for sale in the shops. The mode in which the operation is effected is this: -A vessel, with a movable cover, is provided, and, having removed the cover from it, a piece of metallic gauze of moderate fineness is fixed over it, and the cover replaced. A quantity of sand is then taken sufficient to fili the vessel, and passed through a sieve into an iron pot, where it is heated with the addition of a small quantity of stearin, carefully stirred, so as to thoroughly mix the ingredients. The quantity of stearin to be added is at the rate of half a pound to one hundred pounds of sand. Care must be taken not to add too much, as it would sink to the bottom and injure the flowers. The flowers thus become dried, and they retain their color perfectly.

### Patent Pin.

The Union Pin Company of Boston, are now extensively manufacturing Tower's patent pins. The improvement consists in making a couple of nicks or indentations on the pin, which cause it to hold more firmly when the pin is inserted in any cloth or fabric. In other respects these pins are similar to those in common use. The improvement finds general favor.

### Librarian of the Patent Office.

Prof. W. E. Jillson leaves his position as Librarian valve only one-eighth of an inch off its seat. Under of the Patent Office to take that of Assistant Supergiven general satisfaction in the position from which e is retiring, and his attainments as a linguist and bibliophilist, and his invariable courtesy, make his resignation a loss to the department. He is succeeded by Dr. George C. Schaeffer, who was formerly an Examiner in the Office.

#### BOSWELL'S MUCILAGE BOTTLE.

Persons who have occasion to use mucilage must have been annoyed by the inconvenient brush as generally made. When the bottle is nearly full, the brush becomes overcharged with the liquid, so that a greater quantity than is necessary is smeared on the paper. The handle of the common brush screws through the cap so as to lengthen or shorten it; but this is of no benefit so far as overloading the brush is concerned.

The engraving published herewith shows a neat device for keeping the brush out of the mucilage, or allowing it to be inserted to a greater or less depth, as desired. The attachment consists of an elastic band of rubber, A, applied to the brush and cap in



such a way that a free movement of the brush is ob tained up and down when the handle is pressed upon. So soon, however, as the hold is relaxed, the brush remains at the top of the bottle out of the mucilage entirely.

This is a very neat little affair, and one that will render the use of such things much more agreeable. It was patented through the Scientific American Patent Agency on August 1, 1865, by E. H. Boswell. For State rights to manufacture, apply to him, at south-east corner of Walnut and Eighth streets, Philadelphia, Pa.

A Novel English Invention.—The last number of the London Artizan has an illustration of an air engine, which it calls Messer's air engine. It is precisely the same in principle, and very closely similar in all its details, to the air engine invented by S. H. Roper, of Boston, Mass., which was fully illustrated

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NEW YORK, SATURDAY, SEPTEMBER 30, 1865.

Fig. Mesars Sampson Low, Son & Co., Booksellers, 47 Ludgate andon, England, are the Agents to receive European subscript or advertisements for the Scientific American. Orders seem will be promptly attended to.

\*\* The American News Company," Agents, 121 Nassau street

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#### A SECRET TELEGRAPH.

At the establishment of Mr. Giuseppe Tagliabue, No. 298 Pearl street, New York, there is in operation a telegraph which transmits its messages without allowing them to be read by the operators or any employes of the telegraph company. A merchant or broker in New York is provided with a simple instrument which is furnished with a plain circular alphabet; he moves an index to the first letter of his message, and presses a lever, which punctures a rectangular slot in a roll of paper wrapped upon a cylinder; he then moves the index to the next letter of his message, and punctures another slot; proceeding thus till the message is completed. The roll of paper is then removed from the cylinder and sent to the telegraph office; the boy or girl in attendance wraps it upon the cylinder of the transmitting machine, and starts the machine, which is driven by a weight. As the cylinder revolves, at the opposite end of the line-say in Philadelphia-a narrow strip of paper is carried slowly along through the receiving machine, and the message appears pricked through it in very plain letters. In order that the mes may not be read by the employes at the end of the line where it is received, the strip of paper is covered on both sides with very thin black berege, which must be pulled off before the letters can be seen.

This telegraph is the invention of Mr. Robert Boyle, a Scotchman; he commenced work on it in 1852, and for the last three years has given his whole time to it, day and night, as he says, "dreaming about it in the night and working upon it through the day." After all these years of labor and study, the invention is at last completed, and a patent for it, with sixteen claims, has just been obtained through the Scientific American Patent Agency. The patent is granted to Mr. Boyle jointly with Mr. Tagliabue, who took an interest in the invention before its com-

To make all the details of the mechanism plain would require elaborate engravings; but an idea of the general principle on which it operates may perhaps be given by a brief letter-press description. The punctured paper is wrapped upon a cylinder, which is caused to rotate by a weight. On the same line of shatting with the cylinder, and rotating with it, are two brass wheels, each having fourteen plugs of hard rubber inserted into its periphery. Brass springs, connected with the battery current, rest upon the peripheries of these wheels, the springs being so arranged that the current is reversed twenty-eight times during each revolution of the cylinder. This is the transmitting instrument.

At the opposite end of the line, where the message is received, a permanent horseshoe magnet is delicately suspended between the poles of four electromagnets connected with the circuit, in such a manner that reversing the current causes the horseshoe magnet to vibrate. Each vibration releases a delicate escapement, and allows the rotation one stepor one twenty-eighth part-of a light steel wheel, on the periphery of which are engraved the twenty-six letters of the alphabet, with the character & and a blank for the space between the words. The letters

are formed by rows of fine points. Before the transmission of the message is commenced, both the transmitting machine and the receiving machine are set at zero, which brings the cylinder, on which the punctured paper is wound, and the type wheel into the same relative position. A brass spring, in connection with a local circuit, has its end pressing upon the cylinder that carries the punctured paper, and the connections are so arranged that while the end of this spring is resting upon the paper the local circuit is broken, but when a slot passes under the end of the spring, allowing it to come in contact with the brass cylinder, the circuit is closed. The closing of this local circuit draws forward an armature, and arrests for an instant the motion of the transmitting machine, thus stopping the frequent reversals of the current, and stopping, at the receiving end, the rotation of the type wheel. At the receiving machine is a magnet, in connection with the main circuit, with its armature so adjusted that the magnetism induced by the momentary reversed currents is not sufficient to overcome the tension of the withdrawing spring, but so soon as the reversals are suspended and the current of the main circuit is allowed to flow continuously in one direction, this tension is overpowered, and the armature is drawn forward. By this motion the paper is drawn down upon the type wheel, and the letter which is uppermost at the time is printed. This motion also breaks for an instant the main circuit. and this break is made to withdraw the stop of the transmitting machine, thus permitting the apparatus to proceed to the next letter.

We have seen this machine in operation on a short circuit, and it worked with perfect success. How it will operate on long lines, and in different conditions of the atmosphere, can, of course, be known only by practical trial.

### PISTONS WITHOUT PACKING.

When the first pistons to steam engines were made they were made tight by hemp gaskets-that is, coils of hemp plaited with rope thoroughly slushed or soaked in hot tallow and subsequently driven in as tight as a man striking with a sledge could make them. It was a great step in advance when cast-iron rings were substituted for the bemp and steel springs inserted to keep the rings always up to the cylinder. Ouite as much ingenuity and thought have been expended on the pistons of steam engines as upon any other detail, and the variety in shape, form and kind of packing would make an interesting study for the engineer if they were all collected in book form. The pistons of ocean steamers, for instance, have lighter springs than many small engines, and are not packed so tight, by many degrees pressure, in proportion to their areas, as some engines on land. There are few stationary engines in the country which will pass the centers with two or three pounds pressure on the gage, but there are plenty of steamboats that have engines which will do this with ease.

It was formerly the custom to pack locomotive cylinders with brass rings, which had a central lining of Babbitt metal let in. This also is done away with, and the largest works and the heaviest engines on the Erie Railroad, and others, for aught we know, have cast-iron rings.

In many instances pistons have been used without any packing in them—being simply solid disks fitting tightly, yet easily, to the bore. Some concession has been made to prejudices and conventional ideas by turning grooves in the solid piston and depending on the partial condensation of the steam to fill these grooves with water, and thus interpose an obstacle to the passage of steam between the piston and cylinder. It is probable that the evil of a leaky piston has been much exaggerated, for, although it will show 42,394,500 tuns.

on the indicator diagram when very much out of repair, it is a question whether any great amount of fuel is wasted by such a loss. There is no question, however, but that much damage is done to steam cylinders by bad packing, and many can testify to the scored and seamed cylinders that were made so by forcing in the springs.

Air pumps have been made for compressing air with solid pistons, and, reasoning from analogy, there seems no objection to making the pistons of steam engines of a moderate diameter of cylinder entirely solid; in fact, many are now working so made. and those who built them, as well as the owners, find no fault with their performance. On the contrary, rings are frequently a source of trouble, and, taken altogether, with their springs, followers and follower bolts, the piston with metallic packing is a costly detail. If lessening the cost of construction and retaining the vital qualities of any part is an important feature, then the pistons of small steam engines should be made solid.

### SODA WATER-WHAT IT IS AND HOW IT IS MADE.

It is, doubtless, understood by most of our readers that the term "soda water," as applied to the sparkling beverage drawn from the numerous fountains in apothecary shops, is a misnomer—the liquid being pure water saturated with carbonic acid under pressure, with not a particle of soda in its composition. Water has the property of absorbing its own volume of carbonic acid at all pressures; and as by doubling the pressure twice the quantity of the gas is compressed in a 'given volume, the quantity which water will absorb is in direct proportion to the pressure.

The gas is usually obtained by decomposing carbonate of lime, which is a combination of carbonic acid and lime. A quantity of marble dust is placed in a strong cast-iron cylinder, and the opening is closed air-tight by a screw plug, when a quantity of sulphuric acid is let down upon the marble from a vessel opening into the cylinder. The lime, having a stronger affinity for sulphuric than it has for carbonic acid, abandons the latter to combine with the former; the carbonic acid, on being set free from its combination with the lime, takes the gaseous form and becomes carbonic acid gas. The gas thus liberated is com-pressed in contact with water, when the water is saturated with it, and becomes the mis-named "soda water" of the fountains.

There are two plans for compressing the gas; in one form of apparatus it is done by an air pump, and, in the other, the gas is generated in a close vessel in communication with the water, the pressure being obtained by liberating a sufficient quantity of the gas in a confined space.

The vessel containing the sulphuric acid is lined with lead-that being the only cheap metal which is not acted upon by sulphuric acid. The vessel in which the marble dust and sulphuric acid are mixed together is usually lined with block tin. The gas, before being conveyed to the beverage, is passed through clean water, to remove any impurities with which it may be mingled.

At the fair of the American Institute there is on exhibition a soda-water apparatus, in which the vessel for impregnating the water is lined with glass. As the pressure in this vessel is between 200 and 300 pounds to the square inch, the glass lining would, of course, be bursted, unless effectual means were taken to restrain the pressure. The plan adopted in this case is to open a communication between the interior of this glass lining and the space between this and the inclosing cast iron, so that the pressure is equal on the outside and inside of the glass. It is a very neat and effectual device, and would be perfect if the inventors would carry it a step further, and line the whole apparatus with glass. It is the invention of Messrs. Schultz & Walker, and the apparatus is manufactured by John Matthews, Nos. 437 and 439 First avenue, New York.

On another page, under the heading "Notes on New Discoveries," will be found a description of a new and cheap method of producing carbonic acid, which may be worthy of attention by our soda-water manufac-

COAL IN PRUSSIA. - The total production of the colleries of Prussia, in 1864, was estimated at

### MECHANICS' AND INVENTORS' GUIDE.

We have lately published a new and convenient volume, of 108 pages, upon Mechanics' Patents and Inventions, which promises to be of much value to all who are of a scientific or inventive turn of mind. Although the proportions of this book are not equal to Webster's dictionary, still we venture to say that so large an amount of valuable information has seldom been collected within so small a compass.

The book contains all the patent laws in full, except repealed or salary sections; the principal official rules and directions for conducting business at the Patent Office; 112 engravings of the best me chanical movements, with descriptions, of great value to mechanics and inventors who study the best construction for machinery; a chapter upon the steam engine, with an engraving of the common condensing engine, with letters of reference and nomenclature of all the parts; instruction in practical geometry; table of the effects of heat upon bodies; table of the pressure and temperature of steam; of the electrical conducting power of various substances; forms for assignment of patents; instructions how to obtain patents and caveats; practical directions and best methods for selling patents; hints upon the value of patents; how to invent; information upon the rights of inventors, patentees, assignees, partners and employers; advice as to foreign patents, extensions, reissues, infringements, together with a variety of other highly useful scientific and mechanical facts and calculations, the whole abundantly illustrated with engravings. Price only 25 cents. Address Munn & Co., 37 Park Row, N. Y.

### THE "WINOOSKI" AND "ALGONQUIN."

These two vessels, which have been so long writand talked of, are about commencing their trial for economy of power. It is hardly necessary to recite again all the conditions under which they are to be run-this matter has been alluded to in previous numbers of this journal-suffice it to say, that on Friday last the preliminary trials of the engines took place; that is, the five-hour runs to get ready, and immediately thereafter the ninety-six hour trial was to be entered upon. At the time of our visit the Algonquin was turning her wheels vigorously, while the Winooski, the naval vessel, was lying still, steam not having been raised. Mr. Dickerson deserves commendation for the energy he displays in looking after his interests: he runs his own engine, aided by others, and takes off his coat and goes at it with a The boilers on the Algonquin work admirably. will. The fires were started at 10:18 A. M., and steam started at 10:37; one boiler was cold, the other had water at 120° in it; 1,100 pounds of wood, and 2,000 pounds of coal were consumed in so doing. At 11:45 the engine was started with 45 pounds pressure, and, when we lett, was making 16 turns per minute, with 60 pounds of steam, cutting off at points between half stroke (4 feet 41 inches) and ten inches. We shall publish the results in our next issue.

### PASS THEM AROUND.

We have received a number of letters from corre spondents in various parts of the country, inclosing a printed puffing circular of "Morton's No-ink Pens," purporting to have been patented in June, 1865, and alleged to be a perfect substitute for ink, and requesting people to remit. The circular contains a strong recommendation, pretended to be quoted from the Sci-ENTIFIC AMERICAN. C. V. Morton & Co., No. 21 John street, Jersey City, N. J., is one name under which the humbug is conducted.

In reply to our several correspondents, we have to say that no such patent has been granted, nor have we given any such recommendation. On inquiry in Jersey City, that no such firm or place of business was to be found. We further ascertained that the police were on the watch for the scamps, which has caused them to depart from Jersey City. When we last heard of them, their victims were directed to address them at Tarrytown, N. Y.

We hope the postmasters at places where these fellows have been or may be operating will take the necessary steps for their arrest. They have swindled hundreds of people.



ISSUED FROM THE UNITED STATES PATENT-OFFICE FOR THE WEEK ENDING SEPTEMBER 19, 1865.

Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other in formation useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific AMERICAN, New York.

Breech-loading Fire-arm. - E. S. Allin, Spring-

9,959.—Breech-loading Fire-arin,—E. S. Alini, Spring-field, Mass.:
I claim, First, The combination of a solid recoil block, A, with a pring, in the manner and for the purpose described. Second, Beveling the front end of the recoil block at c', and form-ng a corresponding bevel, c, on the barrol, as and for the purpose

recribed.

Third, The projection, X, in combination with the lever, f, and ammer. V. substantially in the manner and for the purpose de-

49,960,-Cut-off for Water Conductors.-James Ash,

Sterling, Ill.: claim the adjustable tube, B, applied in combination with the ductor, A, and discharge pipes, D D', substantially in the man-and for the purpose set forth. This invention relates to certain improvements in conductors

water in buildings, and its object is to change the direction of the current from one outlet to another with little trouble or loss of

49,961.—Steam Gage.—Chas. Barnes, Cincinnati, Ohio: I claim the provision in a steam gage of two or more springs, G H, of unequal tension, arranged and operaving in the manner and for the purpose set forth.

49,962.—Mowing Machine.—L. M. Batty, Canton, Ohio.
First, I claim the sliding shifter, L., in combination with the hand
lever, d. and the intermitting lever, d' the pinions, k and k', the
double clutch, i, and the shaft, a as herein described, for the purposes

the cince, and the swivel-jointed stay rod, E, the upright guid second, I claim the swivel-jointed stay rod, E, the upright guid d, N, with the set boit and nut, n, and the shoe, H, in combination th the swivel joint, v, when operating as and for the purposes see

th. Third, I claim the cam lever, F, with the standard and flexible int. t, as herein set forth. Fourth, I claim the arrangement of the outer shoe, J, block, T, d set screw, Z', for raising and lowering the shoe independently the cutter guard, substantially as set forth. Fifth, I claim the colled supporting spring, e, with the set screw, in combination with the frame, B, as herein described, for the

-Harvesting Machine .- L. M. Batty, Canton

Ohio:
First, I claim the seat irons, E, with the set bolts, F, when used as escribed, for the purposes at forth.
Second, I claim the arrangement of the bevel cogs, G, in combination with the driving wheels, H and H, shafts, H and J, the pinion, t, and clutch K; the double sour wheel, L, pinion, M or N, and he crank shaft, N, all connected and operated substantially as set

rth.
Third, I claim the hand lever, o, with the spring, together with the initing rod, A, the coiled springs, R and R, in combination with the pinion, K, and clutch, K', when operating conjointly, as de-

Thuo, A claim, A second aprings, R and R', in comonators are printen, R, and clutch, R', when operating conjointly, as described.

Fourth, I claim the arrangement of drag bar, T, with the filling, the hook, V, the pin, W, the hanging wons, S and S', the switch, the runner, A, the windard g, the run, Z, the local c', the runner, A, the best of the runner, and the lever, d, as set forth, when operating as described. Fith, I claim supporting the reel post, e, and carriage, n, by the tandard, K fastened by a wedge, v, as described. Sixth, I claim the segment lever, P', the rack, y'', and the plate, r, n combination with he reel carriage, n, and reel post, e', in the nanner and for the purpose set forth.

Seventh, I claim the arrangement of the folding arms of the reel. Eighth, I claim the springs, y, in combination with the tolding time, g'' and arm holders, u, in the manner and for the purpose set forth.

Attachment to Harvesters .- L. M. Batty

Canton, Onto: frist, The wrought-iron carriage, E, with its pin, h, and box, i, as and for the purpose set forth. Second, I claim the arrangement of the crooked arm, D D, in com-ination with the peculiar guides, L and I, for operating the rake, ubstantially as set forth.

-Machine for Beveling Picture Frames.-Otis T.

1,305.—Machine for nevering Flattice France.—Out 1.

Bedell, New York City:

First, I claim the use of mechanism, substantially as herein decribed, for the purpose of beveling the edges of photographic picure frames by machinery, in contradistinction to performing the

scribed, for the purpose of beveling the edges of photographic pic-ture frames by machinery, in contradistinction to performing the abor by hand. Second, The combination of one or more knives, F, secured to a Second, The combination of one or more knives, F, secured to a carriage, E, with the self-acting clamp, H, constructed and operat-ing substantially as and for the purpose set forth. Third, The vertical knives or cutters, J, in combination with the nelmed knive or knives, F, and clamp, H, constructed and operating substantially as and for the purpose specified. [The object of this invention is a machine intended to bevel off the edges of pasteboard frames, such as are generally inserted in photo-traphic allum leaves. These frames overall a highest activities the graphic album leaves. These frames are equal in thickness to tw tographic cards of that class generally made for the purpose of rting in photographic albums, and the opening or openings in them are cut out large enough to take in such cards. In order to be able to remove the cards, it is necessary to have one of the ends (generally the lower end) beveled off, for if the edge is left square, and the card or eards inserted into the frame, they can only be removed with great difficulty. ]

Shipping and Unshipping Hind Boards to eight Wagons.—Fred'k W. Bishop, West Haven,

Freight Wagons.—Fred'k W. Bishop, West Haven, Conn. Antedated Aug. 31, 1865:
I claim the combination of the spring boils, c and d, with the strap loop bands, C and D, when the whole is constructed, arranged dirited to produce the result subtantially as herein described. 49,967.

9,967.—Feeding Device for Sewing Machines.—James Bolton and Jerome B. Secor, Chicago, Ill.: We claim, First, The combination of the turning feeding foot of og and the turning feed guide, for the purpose of changing the irection of the feed of the material to be sown from one line to an other at right angles therewith, substantially as described.

described. We also claim the pivoted and adjustable link, L, interposed be-tween the rods, G K, for the purpose of regulating the extent as well as the time of the motion of the carrier, M, substantially as de-

49,968.—Corder for Sewing Machines.—J. W. Brady, Baltimore, Md.:

I claim the corder, E F G H I, substantially as described and represented, and adapted to feed the cord underneath the main fold and into the angle formed between it and the secondary fold. Second, I claim the combination of the devices, substantially as described, by which the corder shank is moved vertically, laterally, but which the corder shank is moved vertically, laterally, but which ward and forward, according to the requirements of this

49,969.—Apparatus for Packing Rubber for Dental Purposes.—F. C. Brown, Palmyra, N. Y.:
I claim the combination of the piston, B, barrel, A, flask, G, heated bath, H, with the accessories, substantially as described, forming an apparatus for injecting rubber into molds.
I claim the combination of the flask, G, piston, B, barrel, A, and indicator wire, f, substantially as described and represensed.

[The object of this invention is an apparatus intended to force ubber around the teeth in making artificial dentures.]

49,970.—Binding Attachment to Reaping Machines,— Jacob Behel, Rockford, Ill.: Islaim, First, The arrangement of the cog-wheel that transmits mo-tion to the ring carrier of a binding apparatus upon the axie of one the wheels, which holds the ring carrier in its place, substantially as

ion to the ring carries to the ring carrier in its place, substantianally of the wheels, which holds the ring carrier in its place, substantially as forth. Second, The combination, in the same binding apparatus, of a ring carrier and a vibrating tension arm to control the compressing strap, substantially as set forth. Third, The combination of the ring carrier of a binding apparatus with a strap holder, of suitable size and form to seize and hold the snotted end of a rope-compressing strap, substantially as set forth. Fourth, The combination of the detachable strap holder with an escapement, which permits the compressing strap to relax its grasp upon the grain and subsequently to be withdrawn from the sheaf, substantially as set forth.

Fifth, The combination of the twining cord holder with the ring arriver, substantially as set forth.

escapement, which permits the compressing strap to relax its grasso upon the grain and subsequently to be withdrawn from the shear, substantially as set forth.

Substantially as set forth, the twining cord holder with the ring carrier, substantially as set torth.

Such, The combination of the twining cord holder and ring carrier with the grooved case, substantially as set forth.

Seventh, I claim the combination of the cord spool and its friction apparatus with a swinging frame and cord guide, substantially as set forth, so that the tension is relaxed by drawing the binding material from the spool.

Eighth, The combination of the proving frame of the tying bill with the fixed transwork of the binding apparatus by toggle-jointed links, substantially as set forth. The combination with the cord holder of a movable protector, substantially as set forth.

Tenth, The combination of the tying bill and movable knife, substantially as set forth.

Twenth, The combination of the knife and the instrument for transmitting motion to the escapement of the compressing strap holder, substantially as set forth.

Thirteenth, The combination of a pair of spring dogs upon the framework of the binding apparatus, substantially as set forth.

49,971 .- Cork Machine.-Harris Boardman, Lancaster,

tially in the manner specified.

49,972.—Coal-mining Machine.—E. K. Bruce and Jno.

M. Bruce, Liberty, Pa.:

First, I claim the combination of the frame, B, shafts, E.F., bevel gears, c.d. drill spindles, C, truck, A, toothed rack, I. and feed shaft, H, all constructed and arranged substantially as and for the purpose specified. 1, all constructed and an angular substantially as an according to the drills of spiral flanges with grad-second. The application to the drills of spiral flanges with grad-tally increasing pitch, substantially as and for the purpose described.

[This invention relates to a machine which consists of a series of horizontal drills laying parallel with each other, and rotaneously by suitable gearing in the rear of the frame which forms their bearings. The frame moves back and forth in suitable ways, in the side timbers of a truck, so that the frame can be fed toward or from the bed of coal to be excavated, while the truck rests on wheels, and can be moved in a direction at right angles to the motion of the drill frame.]

-Machine for Sowing Plaster .- Alpheus Bugbee,

19,973.—Machine for Sowing Plaster.—Alpheus Bugbee, Elkhart, Ind.:

I claim the shape and construction of the double forks and stir-ers, E, when arranged and combined with the slides, D, and oper-ticed as herein described and for the purposes set forth.

I also claim the shield, R. as arranged and combined with the stir-ers, E, for the purposes set forth.

19,974.—Sorghum Evaporator.—Ransom Bullard, Litchfield, Mich.:
I claim the combination and arrangement of the slow evaporating
section or compartment, b b. of the evaporating pan, the direct due
chamber, g, and the side flues, k, extending through the brick
work, so as compartment and the evaporating pan
in the purpose berein specified.
I also claim the described method of constructing and uniting the
sections of the evaporating pan, A, substantially as described.

49,975 .- Amalgamating Apparatus,-W. H. Butler, Chi-

cago, Ill.: cago, i.i.: I claim feeding the quartz into the amalgamating vessel by a forced teed, and holding it immersed or submerged therein by pressure, while it is thoroughly stirred and mixed with the amalgam, using therefor an apparatus constructed and operating substantially as herein described and represented.

tially as herein described and represented.

49,976.—Harvester Rake.—Wm. J. and Rhutson Case,
Plitstown, N. J.:
First, We claim the vibrating upright shaft, D, with rake, J, attached to it, as shown, in connection with the rope, e, connected to the bar. I, and pulley, M, on shaft, N, all arranged either with or without three set forth.

Second, The arrangement of the wheel, H, provided at its upper surface with teeth, e, and the ledge, p, in connection with the part pinion, o, and shaft, N, for the purpose specified.

(This invention relates to a new and improved automatic raking device for harvesters, and it consists in a novel means employed for operating the rake, and in a peculiar arrangement of the same, whereby the cut grain may be raked from the platform without materially increasing the draught of the machine, and without interfering with the other working parts thereof.)

49,977.—Washing Compound.—R.W. Chappell, Chicago,

Iti.:

I claim a washing compound, composed of the herein-described agreed-nts, in the proportions substantially as herein described and pecified.

Implements for Contracting the Barrels of the Main Springs. —Andrew S. Clackner, Roches-

Watch Main Springs.

ter, N. Y.:

First, I claim constructing the barrels of watch main springs by forcing the same within a circular tapering cavity by means of a plunger or other equivalent device.

Second. I claim, in combination with a circular tapering cavity, second, I claim, in combination with a circular tapering cavity, as above set forth, a follower, constructed substantially as described.

as above set forth, a follower, constructed substantially as described.
49,979.—Oil Can.—Benjamin Clark, New York City:
I caim an oil can, having a spring, B, and a lined elastic diaphragm, protected by a guard. A, all substantially as shown and described.

49,980 .- Knitting Machine .- Wm. W. Clay, Philadel-

49,980.—Knitting Machine.—Wm. W. Clay, Philadelphia, Pa.:

Pirst, I claim the combination of the hooked carriers. F, the cams herein described, or their equivalents, for operating the said carriers and the self-actual needles, whether the latter are arranged to operace in parallel radial grooves, in conjunction with a reciprocating thread carrier, all substantially as described.

The described of the plate, A, its opening, a, and grooves, b, with the inclined edges, x, adapted for the reception and operation of the ancilles, D, and carrier, F, substantially as specified.

Third, The combination of the said movable cams with the pattern wheels when the latter are operated by the machine, through the medium of the devices herein described, or the equivalent to the same, for the purpose specified.

Planning Mechine.—Lergoniah Close, Brooklyn.

49,981.—Planing Machine.—Jeremiah Close, Brooklyn, N. Y.:

N. Y.:

I claim the relative arrangement of the adjustable feed rollers,
the form or guide, E2, with the cutter head, B, and cutters, cc, when
operated for the purposes substantially as described.

operated for the purposes substantially as described.

49,982.—Hinge —Jeremiah Close and Ira Buckman, Jr., Brooklyn, N. Y.:
In a hinge composed of three leaves and two pintles, we claim operating the two outer leaves by a power located within a cavity or cartitles in said central leaf, substantially as described.

We claim a hinge, formed with three levers and two pintles, as described, the spring or springs of which are located in a cavity or cartitles, formed in the central leaf, in combination with the wrench or forked spring holder, E. the collar, P. the grooved pulley, D. the vrench or capstan, N. the chain, C. and smaller grooved pulley, D. on the shart of the outside leaf, B, substantially as and for the

purposes herein set forth.

49,983.—Lubricating Compound for Journal Boxes, Etc.
—Hall Colby, New York City:
First, I claim the use of a lubricator composed or asbestos and plumbago mingled with a liquid so as to be capable of being applied to journal boxes and other rubbing surfaces in the manner substantial; a hereinbefore descripted.

2 cond. The use of a fabric made from asbestos, and without any combustable substance incorporated therewith, to be interposed between rubbing surfaces, and saturated with the lubricator above described, in order to produce an anti-friction surface for the journals of heavy machinery and other like purposes, substantially as described.

49,984.—Lamp.—M. H. Collins, Chelsea, Mass.:

an, 25.1.—Lamp.—at. 11. Collins, Ulleisen, Alass.;
I claim the improved lamp as not only constructed with its cone of deflector, E, and its chimney rest, D, and chimney, arranged with respect to each other, as described, but as having the said deflector provided with peripheral springs, or he same, and the slits h, and the said rest, D, made concave-convex, and provided with an annular groot of the same of the

49,985.—Weeding Hoe.—Charles Crofut, Weston, Conn. I claim the adjustable arrangement of the serrated gib, E, an em, D, with the plain gib, F, and key, G, in the manner and for epurpose substantially as herein described.

the purpose substantially as herein described.

49,986.—Umbrella.—Wm. Damerel, Brooklyn, N. Y.:
First. I claim in umbrellas and parasols so securing on the stich
the crown piece or other device to which the upper ends of the ribof such articles are attached as that the said crown piece and the
parts attached to it shall be capacle of rotating on the stick, substantially as descined.

Other, 6. With the longitudinal flanges, a a, and a cap, E, for in
closing the upper- edge of the covering, C, and confining it to the
crown piece, substantially as described.

Norfolk, Va.:

Iciam a screw or screws, B, in combination with a cylinder in the ormore parts, for the purposes specified, substantially as described. -Ferrule for Boiler Tubes.-Geo. W. Durall.

49,988.—Spinning Machine.—James Eaton, Boston,

Mass.

I claim a cylindrical spindle, either solid or tubular, of a mule or other spinning frame, provided with a helical tip, as herein set forth.

I also claim the cylindrical tube or bobbin, either with or without the ferrule or band, it, in combination with a spindle having a helical tip,

I also claim the combination of the cylindrical tube or bobbin, O, with a cylinder having a helical tip, or its equivalent, substantially as herein described and for the purpose specified.

se servin described and for the purpose specified.

49,989.—Decarbonizing Clay Retort.—G. W. Edge, Jersey City, N. J.:

I claim the use of a mixture of steam and air, produced by mean substantially such as herein described, or any other equivalent means, and injected into a retort, for the purpose of decarbonization, as set forth.

49,990.—Clutch or Rope Holder.—C. A. Emery, Spring

field, Mass.: claim the device constructed, arranged and operating substan ly as shown and explained and for the purpose specified.

tady as shown and explained and for the purpose specified.

49,991.—Lock.—Jacob Euteneur, Peorjia, Ill.:
First, I claim the two arms, H H', attached to the hub, G, provided with the pivote burs, I L and connected with the latch, C, as shown, in combination with the two bell hammers, M M', bell, N, and lever, L, the rods, J M, of the hammers being attached to arbors, g i, provided with projections, f h, and all arranged substantially as and for the purpose specified.

Second, The plate or key-hole guard, Q, in combination with the rod or oar, R, arranged and applied to the lock, substantially as and for the purpose set forth.

and for the purpose set forth.

49,992. —Sleeping Car. —Ben Field, Albion, N. Y., and G. M. Pullman, Chicago, Ill.:

Wo claim, First, Constructing a car seat, with back and seat cushions hinged together, and disconnected with said seat, so that the back cushion may be placed on the seat and the seat cushion extended to meet the seat cushion of the opposite chair, in the manner and for the purpose herein set forth.

Second, The berth, A, connected to the side of the car by hinges, B, and supported by jointed suspenders, C, so as to be turned up into an inclined position during the day, and lowered to a horizon al position at night, all as herein described and for the purposes set forth.

3.—Lamp Chimney.—J. G. Floyd, Keokuk, I aim the within-described new article of manufacture, p chimney, with a hole or holes in its sides or parietes the forth and described, or when constructed with any other sides, designed for the same purpose. J. G. Floyd, Keokuk, Iowa 49,993.

19,994.—Cartridge Retractor for Breech-loading Fire-arms.—G. P. and G. F. Foster, Mohawk, N. Y.: First, I claim the expelling pin, P. in combination with the spring, Q. and sere, R. operating substantially in the manner described. Second, The sere, R. actuated to free the expelling pin by implinge-ment upon a projection during the vibration of the breech block. Third, The expelling pin, P, retracted in the upward vibration of the breech block, and reset by the spring sere, substantially as de-scribed.

9,995.—Method of Treating Oil Wells for the Removal of Paraffine.—J. Fraser, Buffalo, N. Y.: I claim the employment of carbonic oxide for treating petroleum

wells to remove obstructions, composed of paraffine and other de posit, substantially as set forth.

49,996.—Bottle Stopper.—Charles Goldthwait, South Weymouth, Mass.:

I claim a metallic mounting for bottle corks, composed of a c, and plate, E, and elther with a metal plate, b, or a wax coveri all arranged and applied substantially as and for the purperein set forth.

herein se: forth.

(This invention relates to a new and improved mounting or metal attachment for cork stoppers for bottles, whereby the corks are rendered extremely durable, capable of being readily drawn from the bottles, and enabled to stop the bottles much tighter than usual.)

the bottles, and enabled to stop the bottles much tighter than usual.]
49,997.—Combined Seed Sower and Stalk Cutter.—B.
A. Grant, Mount Pleasant, Iowa:
First, I claim the combination and arrangement of the crank, M, provided with the lever, N, the slide bar, L, the rods, J J, and the plow standards, F P, when all constructed and operating substantially as the forth. Second, The combination and arrangement of the lever, R, arm, S, the connecting bow, T, and beams, D D, when constructed substantially as herein specified and described.
with the corn-stalk cutter, U, when constructed and operating substantially as herein set forth.

49,998.—Sugar Cane Mill.—James Harris, Janesville, Wis.:

First, I claim the combination of the sliding box, K, bolt, b, spring, a, and yoke, L, with the nut, e, for the purpose of making the milliether rigid or elastic at pleasure, substantially as set forth.

Second, Securing and adjusting the spring attachment of a roller bearing by means of the yoke, L and set acrew, d, substantially as set forth.

set forth.

49,999.—Extension Lever Jack.—W. H. Hartman, Fos-tario, Ohio:
I claim the dogs, h and g, spring, f, band, e, stirrup, c, in combina-tion with the lever, E, and standard, C, when constructed, arranged and operating as and for the purpose substantially as set forth.

and operating as and for the purpose substantially as set forth.

50,000.—Manufacture of Candles from Parafine.—Chas.

Havard, New York City:

I claim a new and improved process for making candies or blocks from the parafine of petroleum, as herein described, using for that purpose the aforesaid ingredients or composition of matter, or any other substantially the same, and which will produce the intended

-Rock-drilling Machine.-Robert Hood, Dayton,

,001.—Rock-drilling Machine.—Rodert Hood, Dayton, Ohio: First, I claim the use of a spiral lifter, B, in combination with one more drills or drill rods, constructed and operating substantially and for the purposes described. second, The cam grooves, i, and sleeves, i, with arms, k, and tap-its, i, in combination with the spiral lifter, B, constructed and erating substantially as and for the purposes set forth.

50,002.—Chimney Cap.—William Henry Horton, Jersey City, N. J.: I claim the inner cap. A. closed at the apex and open at the sides,

Utty, 3x, 4.:

I claim the inner cap, A, closed at the apex and open at the sides and the outer cap, B, open at the top and bottom, while its sides over the apertures in the inner cap, substantially as and for the utpose herent specified. 50.003. - Wind Wheel. - John A. Hubbard, West Moulton,

Me.: Me.:

I claim, First, A wind wheel provided with oblique buckets, b, in onnection with a vane, D, having a shield, E, attached and aranged to operate in the manner substantially as and for the pur-

onnection was a definition of the manner substantially and the purpose set forth.

Second, The gate, F, and wind wheel, C, constructed, arranged and operating in the manner substantially as and for the purpose forth.

Second, The gate, F, and wind wheel, L, combined and arranged wheel. L, combined and arranged to the second secon

Second, The gate, F, and wind wheel, L, combined and arranged and operating in the manner substantially as and for the part and operating in the manner substantially as and for the part forth.

Third, The supplementary wind wheel, L, combined and arranged with the shat, J, and with the cone, M, having the weight, N at tached and connected with the gate, F, substantially as and for the ourpose specified.

Charge Hull, Wallingford, Conn.

purpose specified.

50,004.—Fog Alarm.—George Hull, Wallingford, Conn.:
1 claim the combination of a coil of tubing, C, and one or more
whistles, E, when constructed and arranged in the manner described,
so as to sound a prolonged alarms, for the purpose specified,
50,005.—Gate Post.—G. O. Hutson, Iowa City, Iowa:
1 claim the combination of the gate post provided with shoulders
or grooves, the bearers attached to the lower portion of the gate,
and the band which forms the upper suppo.t, substantially as described and represented.

06.—Compound for Destroying Vermin.—J. Burrows Hyde, New York City: laim a mixture of extract of tobacco and petroleum, for the oses set forth.

50,007.—Saddle Stirrip.—Andrew Ivion, Femme Osage,

Mo.:

I claim, First, A stirrup made in two separate parts, hinged together at the bottom as described in the 'oregoing specification.

Second, The seceral parts of the stirrup, vis., the side pieces, A and A, the bottom piece, B, the spring, h, and the lugs, W and X, or their equivalents, when constructed and arranged as and for the unpose set for the.

50,008.-Shoe Lacing.-Timothy J. Kelleher, Boston

I claim the above described improved arrangement of the studs of the lacings with respect to the two flaps of the opening. I also claim the combination and arrangement of the flies and the tuds with the two flaps, or the same and the lacing of the said pening, as expiained.

opening, as expanied.

50,009.—Churn.—Elisha Kenney, Livermore, Me.:

1 claim, First, The arrangement herein described of the gear metabolism in reference to the dasher, in combination with the advices are proposed to the second of the second of the reciprocating dasher of churns, a described—that is to cay, forming the same of bevel faces of inclined planes, in combination with apertures, substantially as set forth.

50,010.—Car Coupling.—John Lacey and George Wat-kins, Bristol, Wis. Antedated Sept. 10, 1865: First, We claim the hook, B, arranged in respect to the drawhead. A, and operating substantially as and for the purposes set forth and

shown.

Second, We claim the employment of two hooks, B B, combined and arranged with the drawheads, A A, substantially as and for the purposes delineated and set forth.

Third, We claim the combination and arrangement of the drawheads, A A, the hooks, B B, slots, C, rods, B, and blocks, E, as and for the purposes shown and described.

50,011.—Instrument for Opening Sealed and other Cans.
—Samuel D. Lecompte, Leavenworth City, Kansas I claim an Instrument for opening fruit an other sealed cansonstructed substantially as herein shown and described.

[This invention consists in the construction of a simple and easily operated instrument for oponing that class of cans used for putting up iruits, preserves, etc., the same consisting of a bar provided with a suitable knife, which is adjustable, and one end pointed and bent n such a manner that a fulcrum will be provided in which to turn nent after the said end has been thrust through the top

50,012.—Stop Motion for Knitting Machines.—Mark Lee, Needham, Mass.:

Accuming, Mass.:
I claim the improved stop motion composed of the upright sta
A, the bars, E E, with the yarn scraper, F, the dropper or bar,
and the bar, K, together with their appendages, constructed,
ranged and combined so as to be used in connection with any lor
machine for making kintted cloth, substantially as becruin ap

led.

O,013.—Mode of Supplying Railway Trains with Water.

—Lewis H. Lezott, Washington, D. C.:

I claim the arrangement and combination of the sliding gate, D, with its grooved posts, C, iever, G, spring, J, and pursur rod, K, the whole being attached to a railway, and operated by the passage of he cars, as hervin deserthed and for the purposes set forth.

50,014.—Artificial Hand.—Oliver Lindsay and Isaac Vance, Washington, Pa.:
We claim the steel ligatures, slide bar and raichet, or series, in combination with the artificial finger joints, enabling the band to operate as desired, and also the socket, as above described. 50,015

50,016.—Lubricating Compound.—Isaac Lossiel, Phila-delphia, Pa.:

I claim a lubricating compound consisting of the combination of the ingredients herein described, in the proportions substantially as specified.

50,016.—Weather Strip for Doors.—Isase F. A. A. Lynch, Roxbury, Mass.;
1 claim the improved weather strip as made with the scrip of elastic material or india rubber, c.c., to project in opposite directions from the lower and rear sides of the holder, substantially in manner as described.

as described.

And in combination with the elastic strip, e.e., to project from the rear part of the holder, as described. I claim the rebate, d. made in the holder, and arranged with reference to the said elastic strip, substantially as specified.

50,017.-Trace Buckle.-David F. Maine, Mansfield,

Ohlo:
First, I claim the use of a vise, constructed substantially as decribed, and for the purposes men.loned above.
Second, I claim the cam and spring, constructed and used substantially as above described.

stantiany as above described.

50,018.—Cultivator.—Abraham J. Manny, Freeport, Ill.:
First, I claim the employment of the lever. E, the bar, 6, and the
yoke, F, or its equivalent, for the purpose of giving direction to the
machine from the seat, as is herein fully set forth.
Second, Atlaching the plow beams to the hounds or side-pieces, A
A, in such a manner that said beams can be brought closer together
or separated by moving them forward or backward, as is herein

epresented.

Third, The combination of the triangular frame, with the devices or changing the direction of the machine, as and for the purpose ard. The combination of the levers, G and H H, with the plow s, as and for the purpose herein specified.

beams, as and or the purpose herein specime.

50,019.—Lamp.—Charles F. Martine, Dorchester, Mass.

Antedated Sept. 10, 1865:

I claim the perforated cylinder, B, with its flange or ring, c, in combination with a non-conducting base or support, b, to which the perforated cylinder is a tached, operating substantially as set forth, for the purpose specified.

for the purpose specified.

50,020.—Rock Drill.—John M. May, Janesville. Wis.:

1 claim, First, Covering the tace of broken pulleys used to lift and
set free drills, and for other similar purposes, with leather, inderubber, or other suitable slightly clastic material, substantially as
and for the purposes described.

Second, A nor-elastic or rigid bar faced with leather rubber or
other suitably elastic material, on its sides next to metallic pulleys,
when used with metallic-faced pulleys, substantially as and for the
purposes described.

Third, A hollow bar to receive the spindle of a drill, when
the hollow bar and spindle serving as a swivel to allow the drill and spindle
to be revolved horizontally at the same time it is operated vertically
as the drilling process.

be hollow bar is operated between broken pulleys, the holbe hollow bar is operated between broken pulleys, the holbe received horizontally at the same time it is operated vertically
fourth. A spee or vise connected by a swivel to the operating
echanism of a drill, when the vise is constructed substantially as
different or the purposes described.
Fifth, The general arrangement of the pulleys, B' B', bar, L, shafts,
C, guides, S S and R, when combined and operated substantially
and for the purposes described.
Sixth, Elastic washer, m, of rubber, or its equivalent, between the
p of bar, T, and washer, m, in Fig. 4, when used as and for the
propes described.

50,021. - Screw Driver .- James S. McCurdy, Bridgeport,

COHE.:

I claim, as a new article of manufacture, the screw driver as currented with slotted handle and with a blade, having two or mounts pivoted into such handle, substantially as herein described -Construction of Cans. -Henry W. Millar. Utica,

aim constructing the bottom and securing the same to the body e can in the manner shown and described.

[This invention consists in constructing a bottom for a can, pail or other metallic vessel, in a conical form, or in the form of a frustrum of a cone, its apex or point extending upward into the cone, so as to a come, as a per or point extending upward into the cone, so as to strengthen the resisting power of the bottom, and, also, where it may be desirable, to afford a better opportunity for drawing off the entire contents of the can by faucet or the like.

50,023.—Grate Bar Supporter.—W. F. Morgan and F. C. Bartlett, New York City. Antedated Sept. 6,

1865: We claim, in combination with a grate bar or fagot of bars of any convenient form, the application of the truss bar, a, with the space, C, intervening between it and the main bars, B, and with the loops, X, or their equivalents, supporting the truss bar, a, in such manner that the expansion and contraction of the later shall be allowed by sliding one upon the other, substantially as herein set forth

Spinning Jack.—H. L. Moulton, Camden, N. J. claim the stiding bars. R and R', constructed and arranged 50,024.-0.024.—Spinning Jack.—H. L. Moulton, Camden, N. J.: First, I claim the sliding bars R and R; constructed and arranged respect to each other substantially as described, and proviced its such appliances that they shall be simultaneously elevated as accarriage approaches the limit of its inward movement, while one is the bars is at liberty to be depressed after the carriage has consenced its outward movement, without disturbing the other bar, all butstantially as and for the purpose herein set forth.
Second. The combination of the bars, R and R; their wheels. Q disturbing plan, X and X; togethe, with the sprikests, and having disturbing plan. X and X; togethe, with the sprikests, and having of the purpose herein described.
Taird, he vertical bar, R, in combination with the clutch, c, one driving shaft, and the devices herein described, or their equivalents, through the medium of which the bar, R, is caused to operate heast force.

Taird, he vertical val.

The driving shaft, and the devices herein described, or used the devices herein described, or used the devices through the medium of which the bar, B, is caused to operate the said clutch.

Fourth, The combination of the clutch, c, on the driving shaft, with the system of delivering rollers, and the intermediate system of gearing described, or its equiva ent, whereby a positive motion and certain starting and stopping of the delivering rollers are effected.

City:
I claim a sieve for family use, constructed in the form of a
phere and provided with an oscillating frame, the lower p
rhich has a curved rod corresponding with the curvature o
ieve and having upon it a series of spheres or balls, all are
ubstantially as shown and described.

substantially as shown and described.

50,026.—Boot Heel.—Erastus Niwhall, Lynn, Mass.:

I claim the construction of a heel, for boots or shoes, of vulcacilized rubber, or its compounds, or other vulcanizable material, with a core of wood, substantially as and for the purpose specified.

50,027.—Fruit Jar.—P. Pallissard, St. Anne, Ill.:

I claim the hooked straps, ff, catching under the flange, g, of the bottle, and perforated to receive the noticed bridge piece, d, as here-indeed the strange of the bottle, and of the bridge piece, d, as here-indeed the strange of the s

isim the hooken was appeared, and perforated to receive the noteness to large seribed.

seribed.

cond. The lateral openings, a' b', arranged in relation to the cond. The lateral openings, a b, in the corner, in the manner and for the pursheren specified.

(This invention relates particularly to the means of filting the las of closing down its top. The top is provided with two openings, sing clear through it, one being intended to introduce the liquid with which the jar is to be filled, and the other to let the air escape from the interior of said jar. A bridge bar—the notched end of which catch is slotted hook straps, and which is provided with a suitable set screw-serves to press the top down upon the neck of the jar. The hook straps catch under the bead which encircies the 50,028.—Bolt Machine.—Hugh M. Phillips, Indianapolis,

Ind.:

rst, I claim the bolt anvil, as described, when operating in contion with the gagel block, G, substantially as and for the pursues ast forth.

s ast forth,

s ast forth the same from opening while the head is being formed, tantially as set forth.

60,029.—Apparatus for Carbureting Air.—E. A. Pond and M. S. Richardson, Rutland, Vt.: First, in machines for generating illuminating gas by charging throughperic air or hydrogen with order composed of pipe or tide, et alican the employment of a prizer composed of pipe or tide, et alicant the component of a prizer composed of pipe or tide, et al. aprintly, or otherwise, as and for the purposes hereinbefore sot

cond, In machines for generating illuminating gas by charging spheric air or hydrogen with vapor of hydro-carbon fluids, we in combination with the tubular vaporiser, as described, a ly reservoir to maintain said vaporizor constantly filled, sublailig as herein set forth.

In machines for generating illuminating gas by charging spheric air or hydrogen with the vapors of hydro-carbon fluids, aspheric air or hydrogen with the vapors of hydro-carbon fluids, and the employment of an elastic or fexible air-diaphragm in set forth-netted and arranged for operation substantially as in set forth-netted and arranged for operation substantially as

pump constructed and arranged for operation seems to the class to fit of the construction of the construct

perate the said pump, substantiany as and price the said pump, substantiany as an interpretable. In machines for generating illuminating gas by charging finospheric air or bydrogen with the vajor of hydro-carbon fluids, e claim the combination of the following elements:—First, A flexible or elastic disphragm pump, or other pump, perating without the use of water or other liquid. Second, A tubular vaporizer, substantially such as herein deribed; and, Third, A spring-power mechanism to operate the pump, substantially as described.

50,030, -Gaiter Boots, -Thomas Powell, Richland, Ind. claim the embloyment or use in gatters or shees of a double folding gore, B, stitched by the side of a vertical cut or slit made in the upper leather from the top downward, at the rear of the gatter or shoe, and either with or without the horizontal cut, sub-stantially as and for the purpose set forth.

stantially as and for the purpose set forth.

5.0,631.—Show Plowy.—E. A. Putham. Oakfield, Wis.:

i claim. First, The application to a car truck or railroad cur of plows, arranged in such a manner that they may swing or work or plows, arranged revers, and still allowed to pass over obstructions, substantially as set forth.

Second, The bars, B, provided with inclined surfaces and having the spings and plows attached to them in such a manner that the plows may be raised by moving or sliding the bars, and without needing with any resistance from the springs, substantially as described.

orned.

Third, Operating the sliding bars, B, through the medium of the ranks and slotted plates, substantially as set forth.

[This invention relates to a new and improved plow for removing

the snow from the inner sides of the rails, where the flanges of the wheels run. The invention consists in applying plows to a car truck in such a manner that they will be held down to their work with sufficient pressure to remove the snow, and at the same time be allowed to yield or give to obstructions, such, for instance, as a road-crossing or a switch track.]

50,032.—Barber's Chair and Stool.—Henry Remick,
Portsmouth, N. H.:
I claim. First, The chair, A. constructed with folding legs and with
receptacles, substantially as above described.
Second. I also claim the stool, P, constructed substantially as
above described.
Third. I also claim the combination of the chair, A, and stool, P,

Third, I also claim the combination of the chair, A, and stool, P, better the combination of the chair, A, and stool, P, better the chair at the combination of the chair, a shown as the combination of the chair, a constructed with an bholistered and a barred side, substantially as shown.

50,033.—Feed-water Apparatus.—G. Adolph Riedel, Philadelphia, Pa. Antedated May 11, 1865:
I claim, First, The vertical reciprocating receiver, c, constructed, arranged and operating substantially as described and for the purpose set forth operation of the reciprocating receiver, c, constructed, provided the combination of the red, I, with the receiver, for the purpose of c combination of the red, I, with the receiver, for the feed pipe and the pump or injector, substantially as described.

feed pipe and the pump or injector, substantially as described. 50,034.—Automatic Boller Feeder.—G. Adolph: Riedel, Philadelphia, Pa. Antedated July 26, 1865:
1 claim, First, The oscillating receiver, H, for opening and closing the communication between the feed-pipe and boller, combined and arranged with the valves, C F and L, substantially upon the principle and in the manner above set forth.

Second, The lever, M, constructed substantially as described, and combined and arranged with the receiver, H, and valve, L, as and for the purposes above set forth.

E-purposes above set form.

,035.—Automatic Boller Feeder.—G. Adolph Riedel,
Philadelphia, Pa. Antedated, May 11, 1855;
I claim the combination and arrangement of the receiver, C, with
the valves, E F, pipes. B B, and levers, K K, with reference to the
dedpipe and boiler substantially upon the principle and in the
anner herein set forth

ase neren set form.

36.—Machine for Manufacturing Sheet Lead.—John Robertson, Brooklyn, N. Y.:
laim the arrangement of the water cylinder, the ram, the adbible dies, and the supporting and adjusting nut of the central
which carries the male die, substantially as herein described,
reby provision is made for forcing out the lead in a downward
tion, and convenience is afforded for adjusting the dies to regthe thickness.

50,037.—Compass.—Paul Roessler, New Haven, Conn... I claim a reversable socket, presenting at one end a steel point and at the other a pencil, substantially as and for the purposes specified.

50,038.—Cigar Wrapper.—Cristopher E. Roffee, Barring-ton, R. I.:

ton, H. 1.: aim making an artificial wrapper for cigars, by covering the non-brown paper of commerce with a coating of paste made tobacco, in the manner substantially as described.

rom robusecs, in the manner substantially as described.

O,039.—Composition for Refining and Hardening
Steel.—Henry Rescoe, New York City:
I claim, First, The use of a composition, consisting of chlorate of
otasis and carbonate of sods, for hardening and refining steel.
Second, The use of borax, in connection with either chlorate of
otash of carbonate of sods, or both combined.

[This levention relates to a composition which will render common steel fit for good tools—which will restore steel that has been de-

stroyed by overheating, and which prevents steel from cracking in

50,040.—Fleece Folder.—Charles W. Rudgers, Brecks-

ville, Ohlo:
I claim the hunged head block, D, and adjustable follower, H, in
ombination with the leaves, C, strap, F, and spring, B, or its equivlent, operating as and for the purpose set forth.

seen, operating as and for the purpose set forth.

50,041.—Hand Loom.—John Seaman and Wm. Y. Henderson, Andover, N. Y.:

We claim, First, The drivers, t.V. and cam dlaks, a2 a2', in combination with the lay. L. and with the shutter of a loom, constructed and operating substantially as berein described.

Second, The method bear allegated of producing the motion of the heddles are the described of producing the motion of the date, as and for the purpose set forth.

-Piano Stool.-George A. Sherlock, New York

City:
I claim arranging the seat of a plane-forte stool upon its body in
substantially the manner described and for the purpose specified.
I also claim, in combination with the above, the use of the guards,
r, for the purpose explained.

[This invention consists in so arranging the seat of a pianoforte stool upon its body portion that it can be readily adjusted and set at any desired hight from the floor, so as to adapt it to the varying hights of persons using it.

50,043.—Graduating Boot and Shoe Patterns.—Nathaniel Silvester, Boston, Mass.:
I claim, First, The steps or graduators, constructed and arranged substantially as described, for the purpose of graduating boot and

I claim, First, the series of the purpose of graduating book and substantially as described, for the purpose of graduating book and shoe patterns.

Second, The combination and arrangement of the arms, A B, graduations, and capture of the combination of the purpose described.

50,044.—Spinning Jack.—Augustus and George Simpson, Woonsocket Falls, R. I.:

We claim the dusk wheel, C, and tappet, F, in combination with a spring latch, G, or their equivalents, arranged to operate substantially as described, for the purposes specified.

50,045.—Auger Handle.—D. Y. Smith, Jollet, Ill.:

I claim, in combination with the auger shank and head, and the handle and soluted turning band, the cam swell or ledge margining the slot, d, so as to compensate for, and take up, all the wear between the shank and its socket, and hold the auger always tightly to its handle, substantially as described.

nandle, substantially as described.

50,046.—Means of Attaching Sheer Poles to Standing Rigging.—Edward Smith, New York City:

I claim the attachment of the sheer pole to the lower part of each of the sockets, B B, which receive the shrouds, by means of two lunks, C C, one in each side of the socket, the said lunks being attached to the said socket by means of the joint pins, c c, which connect the said socket with the dead eye, all substantially as herein described.

said socket with the dead eye, all substantially as herein described.

50,047.—Balling Apparatus for Packing Tobacco.—I. H.

Stone, St. Louis, Mo.:

First, I claim the retaining bars, E. and keys, x, for the purpose of holding the case together so it can be removed from the press as soon as the pressing operation is performed.

800.01. In connection with the posts, Li', and hooks, i, and plate, I', as and for the purpose set forth.

1. as and for the purpose set forth.

Third, I claim the joint bolts, b, when constructed and used as and for the purpose herein described.

or the purpose herein described.

0,048.—Breech-loading Fire-arm.—T. L. Sturtevant,
Boston, Mass.:

I claim the combination for elevating the barrel, and operating
he cartridge-shell discharger, in manner as described, the same consting of the lever. D, the spring, b, the stud, l, and the spring
atch, k, the whole being arranged together substantially as set
orth.

50,449.—Lubricating Compound.—David C. Taylor,
Goshen, N. Y.:
I claim a lubricating compound, made of the ingredients herein
set for h. and mixed together in the manner and about in the proportion specified.

[This invention relates to a compound which may be used to ad-rantage for journals or bearings of any desired description, and which is particularly intended to [prevent said bearings from run-

50,650.—Snow Shovel.—D. N. Thayer, Mayville, N. Y.:
First, I claim a snow shovel, which is provided with a guard, C,
extending transversely across its paim, and also a handle, c, or its
equivalent, substantially as described.
Second, In a shovel, in which the handle and blade are on a straight
line, and in the same piece, I claim the hand protector, d, applied to
the guard, C, substantially as and for the purpose described.

the guard, C, substantially as and for the purpose described.

50,051.—Car Brake.—W. W. Todd and John Vandercar,
Brooklyn, N. Y.:

We claim the segmental cogged plates, A A', operated by the foot,
at either or both ends of the car at the same time, by means of
levers, 1234, arranged in the manner and for the purpose substantially as described and shown in the drawings.

50,052.—Cultivator.—J. P. Tostevin. Racine, Wis.: First, I claim the combination and arrangement of the ton First, I claim the combination and arrangement of the tonga-then extending back and joined to the cross piece, C, substant s shown, the bolts, J J, the set screw, K, and frame, B, when tructed and operating substantially as and for the purposes with

Second. The combination and arrangement of the cross piece, C, provided with the slot, a, the T-bolt, H, plow standard, E, provided with the slot, a, the T-bolt, H, plow standard, E, provided with the slot, b, base, F, and rod, D, when operating substantially as Tally and the combination and arrangement of the cogged sectors, N and O, with the wheel and frame of the cultivator, when operating substantially as herein specified.

Fourth, The combination and arrangement of the lever, L, slide cod, U, notched standard, R, shaft, X, and sector, N, when contructed and operating substantially as and for the purposes herein set forth.

50,053.—Valve of Steam Engine.—C. W. Tremain, Mem-

50,653.—Valve of Steam Engine.—C. W. Tremain, Memphis, Tenn.:

First, I claim the cylindrical steam chest, H, with grooves or pipes, A, partly encircling it, the same forming steam passages to the cylinder, substantially as described, with the groovs, A, the processed, B, and the cover them, and projections forming seats for the valves or rings, R, and being perforated with numerous diagonal holes for the passage of steam, substantially as described.

Third, I also claim in cylindrical valves which have reciprocating motions in their chests, making openings throughout their length, to permit steam or other fluids to pass to that end of the chest which is furthest from the induction passage, I, substantially as described.

50,054.—Flour Sifter.—L. W. Turner, Meriden, Conn. claim, as a new srticle of manufacture, a flour sifter, composed a suitable case, a conical sleve and a revolving frame, when the me is composed of spirally fitted blades, and a brush or brushes, d the whole is fitted for use, substantially as herein described.

and the whole is fitted for use, substantially as herein described.

50,055.—Beer Cooler.—Francis Uhrland, Buffalo, N. Y.:
First, I claim a beer cooler, with an adjustable cover, substantially and for the purposes herein described.

Second, I claim the main tube, E, and the cover, A, in combination with tubes or pipes, D D D D, heads, B and C, substantially and for the purposes herein set forth.

Beer Cooler.-Gardner Waters.-Cincinnati 50,056

Unio:

I claim the cooling of beer or other liquids, by passing the same continuously through a cooling medium, or, vice versa, the cooling medium through the beer, by means of the rotating lantern cylinder, B, or its equivalent, and the outer case, A, combined and arranged for the purpose, substantially as herein specified.

50,057.—Shoe.—Fitch Weed, Middleboro, Mass.: I claim a shoe, as made with the back piece, c, inverted between and sewed to each of the quarters, a a, of the upper, and runni from the top jown to the heel of the sole, substantially as hereini fore specifies.

tore specified.

50,058.—Instrument for 'Canceling Postage and Revenue Stamps.—C. S. Wells, Chicopee, Mass.:

I claim the tube, D. provided with a spiral groove or slot, d. and having a cutter, e, at its lower end, in combination with the rod, C, provided with a lateral pin, c, fitted in the groove or slot, d, of tube, D, the above parts being within a case, A, which constitute a gage resting firmly on the paper, and remaining stationary, while the cutter turns within it, and all arranged in connection with a spring, E, to operate in manner substantially as and for the purpose herein set Chicago.

dated Sept. 15, 1865:

I claim a double trunk, opening front and back, with the cotopening in front, the cot having double bars, D and E, of wood and 1700, and folding legs. L, with booked stay, M, and the lid, B, as a rest or place for the pillow, and shelter for the head, when arranged and combined as herein described, and for the purposes set for the.

purposes set to the purpose set

50,061.—Air Engine.—Stephen' Wilcox, Jr., Westerley, R. I. Antedated Sept. 9, 1865:
First, I claim automatically regulatin. the proportions of air passing over and through the fire, by the variations in ,the pressure of the air, substantially in the manner and for the purpose herein set forth.

orth. A substituting in the manner and for the purpose neron set orth. Second, I claim causing the induction valve, I, to act as a variable second, I claim causing the induction valve, I, to act as a variable of cut-off, substantially in the manner and for the purpose herein thorth, I claim mounting the safety valve, o, on the compressing ision, a2, of a hot-air engine, substantially as and for the purpose erein set forth.

Fourth, I claim constructing the cylinder, A, or pump, 'a', or oth, of sheet metal, in the manner and for the purpose herein set orth.

both, of sheet mean, in the mainter and to the period forth.
Fifth, I tlaim, in connection with the last, the ventilated jacket or protection, A3, constructed and arranged substantially in the manner herein set forth.
Sixth, I claim the within-described arrangement of the bonnet, Q, and the valves, F and G, with their seats and passages cast on the cyribder, and arranged substantially in , the manner and for the purposes herein set forth.

50,062.—Hot-air Engine.—Stephen Wilcox, Jr., West-

50,062.—Hot-air Engine.—Stephen Wilcox, Jr., Westerley, R. I.:
First, I claim the pipe, 3. connecting the interior of the furnace, B, with the upper portion of the reservoir, I, for the purposes herein set forth.
Second, I claim the loaded piston, t, in combination with the cock, 4, adapted to regulate the area of the orifice in the cock, 4, through which the petroleum flows from the reservoir, I, to the furnace, B, according to the fluctuations of pressure obtaining in the furnace, B, substantially as and for the purpose herein set forth.
Third, I claim the arrangement of the hest-conducting spurs, 13, burner, 9, and evaporator, 12, substantially as and for the purposes between the set of hydro-carbon vapor into the furnace of an air engine, substantially as and for the purpose herein specific.
Fitth, I claim, in combination with an air engine adapted for the use of hydro-carbon vapor in the manner substantially as specified, the jet-holes, II, ard not one or more pistons or stops, II, arranged immediately adjacent thereto, so as to jet with the full veicetty, even when partly closed, all substantially as and for the purpose herein set forth.
Sixth, I claim the employment, in an air engine of an elevated

when party closed, all substantiany as an as a second party closed, all substantially as an account of the second party of the

50,063.—Bottle Stopper.—J. A. and G. E. Woodbury,
East Cambridge, Mass.:
First, We claim the hinged disk, B, provided with the packing, e,
and hasp, C, or their equivalents, in combination with the wire, F,
applied to the mouth and neck of a bottle, substantially as and for
the purpose described.
Second, The fixed ring or seat, M, provided with lugs, n n, projection, h, and packing, e, and hinged to the disk, B, substantially as
set forth and for the purpose described.
Third, Forming of the twisted ends, h, of the wire, F, a catch for
the hasp, C, substantially as described.

the hasp, C, substantially as described.

50,064.—Seat for Water Closets.—Eber Woodruff, Chicago, Ill.:

First, I claim the combination and arrangement of the hinged seat, Ill.:

for the purpose specific.

Second, The combination and arrangement of the hinged seat, D, and pivoted cover, C C, and wedge shape pieces, Land J, when arranged and operated substantially as and for the purposes herein described.

50,065.—Seed Planter.—Alpheus Bugbee (assignor to himself and Andrew J. Foster), Elkhart, Ind.:
First, I claim the construction and combination of the spurs, F, with the carriage axle or single shatt, B, to operate the seeding slide and agitate the grain, as herein described.
Second, I also claim suspending the teeth, C, at their backside to the rear ends of the arms, I, as described.
Third, I also claim the arrangement, construction and combination of the plates, U, with their vibrating bar, W, operating in a slotted V-shaped hopper, S, as herein described, for the purpose of sowing grass seeds.

sowing grass seeds.

50,066.— Harvester Rake.—Wm. F. Cochrane (assignor to himself, B. F. Warder and J. C. Child), Springfield, Ohio:

First, I claim the combination of the goose-neck or arched rake arm, having both a vertical and a horizontal turning movement on tas pivot, with the guide slot and switch latch, substantially in the manner and for the purposes described.

Second, The [combination of the guide slot, the switch and the goose-necked vibrating sweep rake with the mechanism for driving said rake, when arranged and operating substantially as and for the purposes set forth.

Third, The combination of the rake head, swivel ring and adjusting washers, arranged and operating as described.

50,067.—Paint Brush.—Samuel P. Fanght, Foxboro.

ning wasners, arranged and operating as described.

50,067.—Paint Brush.—Samuel P. Faught, Foxboro,
Mass, assignor to himself and William T. Cook,
Boston, Mass.:
I claim the double socket, A. provided with a partition, a. in combination with the conical wedge, D. and screw, e, substantially asset forth.

50,068.—Paint Compound.—Darwin P. Flinn, Geneva, N. Y., assignor to Wm. S. Miller, New York City: I claim a paint composed of oxide of zinc, lime, resin, linseed oil and milk, in about the proportions hereta specified.

and milk, in about the proportions hereta specified.

50,069.—Heat Radiator for Stove Pipes.—N. F. Goodrich, Meriden, Conn., assignor to himself and Isaac L. Holmes, Haydenville, Mass.:

I claim the central pipe, 0, provided with a damper, D, in combination with the pipes, B, and chambers, A. A, all arranged substantially as and for the purpose specified.

[This invention relates to a new and useful improvement in a heat radiator for stove pipes, and is a good, simple and economical de

vice for the purpose.]

50,070.—Brick Machine,—Isaac Gregg (assignor to Isaac Gregg, Jr.), Philadelphia, Pa.:
First, I claim starting the pistons or followers of the molds, together with their contained bricks, separately or in succession, by means of the inclined, B B', or their equivalents, acting upon the stems, a, of the said pistons, substantially in the manner described, for the purpose of saving power and relieving the lifting levers of the said brick machine from the great strain consequent upon their starting, and lifting, as herectore, the whole of one set of the pistons and bricks at one operation, by changing the direction of the current of the proper from the set of filled molds to the set of empty ones under the hopper from the set of filled molds to the set of empty ones under the hopper from the set of filled molds to the set of empty ones under the hopper from the set of filled molds to the set of empty ones under the hopper by neans of the moving partition, c', or its equivalent, operating substantially in the manner described, for the purposes specified.

Third, I claim the arrangement of the steam-heating chambers, D D, in combination with the plates, d2 d2, near the ends of the hopper. C, substantially as and for the purpose described.

Fourth, I claim giving the described alternating motions for ward and backward to the two lubricating sweeps or mold clearcra, E E' by means of the dvided rock shafts, M d', and pmions, m2 m,5 and a will, by means of the apparatus consisting of the hand wheel, H, rollers, K fand o, ratchet wheel, K', pawl, K2, treadle, N, and cord, P, supported in a suitabir frame, L, and connected with the friction roller, G, by means of the cords, P p, or their equivalents, so as to operate substantially as described and set forth.

50,071.—Cooking Stove.—Marcus L. Horton, Claremo N. H., assignor to Sidney Smith, Greenfield, Ma I claim the open space, D, and apparatus and register, A, as

ranged and in combination, operating as described and for the pur-

poses set forth.

50,072.—Cooking Stove.—Marcus L. Hortor, Claremont, N. H., assignor to Sidney Smith, Greenfield,
Mass.:

1 claim the E, with cap, A, and improved flue, C, as arranged and lo combination, operating as described and for the purposes set

o,073.—Coal Stove.—Zebulon Hunt, Hudson, N. Y.,
assignor to himself and Wm. J. Miller:
First, I claim the double flue, D D', in combination with the cirular hot-air chamber of flue, F, when both are constructed and aranged in manner and for the purpose set forth.
Second, I also claim the bridge flue, H, in combination with the
reular flue, G, when arranged substantially as and for the purpose

orth.

774.—Machine for Shaping Crimping Forms.—J. H. Jellison (assignor to C. and J. R. Plerce & Co.), Milford, Mass.: taim the combination and arrangement of the rotary cutter sl. A. and its shart, with the mechanism, substantially as deed, for moving such cutter head vertically, either slowly or sudy, as may be required, the whole being applied to a table, as exect.

ined. also claim the combination of the rotary cutter wheel, its shaft, e mechanism for moving the wheel vertically, as set forth, and e two carriers, E and F, made substantially as specified.

50,075.—Gas Burner,—Hugh L. McAvoy (assignor to himself and E. S. Hutchinson), Baltimore, Md.: I claim the gas burner provided, as described, with three or more parallel or hearly parallel shitz. I claim the gas burner provide parallel or nearly parallel slits.

parallel or nearly parallel sitts.

50,076.—Apparatus for Carbureting Air.—Hugh L.
McAvoy (assignor to himself and E. S. Hutchinson),
Baltimore, Md.:

1. Italim, First, The described gearing and shafting by which the
motor shaft, as connected with the forcing wheel shaft, F, through
a scond, The air pipe, R, which supplies the air to wheel from the
chamber in which the regulator operates.

Third, The described form of regulator, inclosing an air space between a cylinder and conical frustrum, and whose sectional area of
displacement is increased as it sinks in the fluid.

Fourth, The automatic valve, d, in combination with the chamber,
A, pipe, c, and supply pipe, R.
Fifth, The valve, I, suspended from the regulator and controlling
the lower orifice of the pipe, H, which supplies carbureted air to the

regulator.

Sixth, The reservoir, Y, situated above the gas-generating chamber, and communicating therewith by the pipe, Z, guarded by the valve float in the chamber, D.

Seventh, The combination of the upper reservoir, Y, chamber, A, and regulator, B C, with the lower chamber, D, and air-forcing wheel, E, communicating with each other by the passages for flud, air and car burneted air, substantially as described.

air and ca rbureted air, substantially as described.

50,077.—Apparatus for Purifying Kaolin, Etc.—Thomas Moore, Cornwall, Conn., assignor to John Ellerby, New York City:
First, I claim passing the mineral to be dressed, in connection with a current or currents of water or other suitable liquid, through the current or currents of water or other suitable liquid, through dood gates arranged in such a manner as to be opened and closed at pleasure, by means of which gates the said passage of the water with the mineral can be regulated according as may be necessary, substantially as herein described.

Second, Delivering the mineral, after having been dressed, in any proper manner, to one or more suitable receivers or tanks at or near the bottom thereof, substantially as and for the purpose specified.

near the bottom tactory,

field.

Third, Removing the clay from the receivers of the cleansing or
dressing apparatus, through any suitable opening or openings in

the better of the same, substantially as set forth.

50,078.—Rocking Horse.—Leven C. Percival (assignor to himself and E. H. Deemer), Philadelphia, Pa.: First, I claim the hobby horse constructed substantially as denoted—that is to say, supported underneath by a pivoted attachment to a standard erected on the wheeled platform, the hind feet attached to the crank on the rear axie, while the forward parts are left free, substantially as described.

Second, The guiding bride line connecting from the bit to a place seed to the crank of the property of the property of the property of the platform, arranged as described, and for the purpose specified.

Third, The use of the winging frame, x x, for lifting the platform, arranged as described, and for the purpose specified.

[This invention relates to a novel arrangement of a rocking horse by the rocking movement of which its carriage is propelled, and con ists principally in the steering devices for guiding the carriage in any desired direction, and also in the use of frames connected in such manner to the carriage that its wheels can be lifted from the ground, and thus the propulsion of the carriage prevented as the horse is rocked.l

079,—Leather Roller.—D. H. Priest (assignor to him-self and B. S. Harrington), Boston, Mass.: claim. First, So applying the adjustable table as to allow it to and fail automatically with the various depths of skin about the er or shaft. coond, I claim the combination of the toggles and the levers with adjustable bed, provided with a feeding roller and the winding er or shaft.

r.dler or shaft.

50,080.—Cotton Gin.—Francois Durand (assignor to E. P.H. Gondonin), Paris, France:

I claim, First. The combined operation and arrangement of the two ginning rollers, i and it, the surface of the roller, i, of which is provided with a series of inclined annular or endiess elliptical corrugations or grooves, situated parallel to each other and the surface of the other roller, i', being smooth, the said corrugated or grooved creating in combination with the smooth ginning roller, i', prothe purposes set forth.

Second, In combination with the rollers, i', the general arrangement and combination of the parts, acting in concert therewith, substantially as described and illustrated in the annexed drawings, and for the purposes set forth.

and for the purposes set forth.;
50,981.—Process of Collecting Spirit During the Refining
of Sugar.—Francis Reid, Liverpool, Eng. Ante
dated June 21, 1865:
I claim solely the collecting and saving of such spirit or alcohol as
may be generated and thrown off during the process or boiling or
refining raw sugars, concrete, toclado and molasses, substantially in
the manner and for the purposes hereinbefore described and set
forth.

50,082.-Manufacture of Gun Cotton.-J. J. Revy, Vi-

on, os.,—manufacture of Gun Cotton.—J. J. Revy, Vi enna, Austria: I claim an explosive compound, made substantially in the rean her and for the purposes described.

ner and for the purposes described.

50,083.—Manufacture of Gnn Cotton.—J. J. Revy, No.
28 Grosvenor Street, Eaton Square, Eng.:
1 claim, First, The preparing the cotton for use, in the manufacture of gun cotton, by washing it in an alkaline solution.
Second, The process of dipping or steeping the cotton, as herein-bloovest forth, small and regular quantities of the cotton being siderable quantity of and, in a dripping vessel containing a considerable quantity of and, in a dripping vessel containing a considerable quantity of and, in a dripping vessel containing a considerable quantity of and, in a dripping vessel containing a considerable quantity of and, in a dripping vessel containing a considerable quantity of and, in a dripping vessel containing a conference of the containing a containing a considerable quantity of and, in a dripping vessel containing a conta

peration, brought ones to that removed by the portion of comma last dipped.

Third, The general arrangement of the apparatus hereinbefore described and shown in the annexed drawings.

Third, The general arrangement of the apparatus hereinbefore described in the second of the gin cotton of the properties of the gin cotton of the acid from the interior of the machine. All of the properties of the gin cotton in layers on suitable perforated shelves and causing water to filter or percolate through it.

Fifth, The treating gun cotton with water glass by means of a centringal machine, as hereinbefore described.

Sixth, The employment for treating gun cotton, of water-glass solution.

50,084.—Mode of Making Bars, Shafts, and Other Artiticles Composed of Iron and Steel.—Charles Sanderson, Sheffleld, Eng.:

I clain the manufacture of railway bars, shafts, girders, ship plates, boiler and bridge plates, and other articles, from masses of wrought iron and cast steel, or of wrought iron and homogeneous iron or steel (made by, and known as, the Bessemer or pneumatic process), and the uniting of large masses of the above metals, in which the combination is effected, in the manner herein described.

on the combination is enected, in the manner herein described.

885.—Apparatus for Preserving Beer and Other Liquids.—Thomas Byrne, New York City: claim, Frist, The preservation of liquids or liquors on draught, stantially as and for the purpose herein set forth. econd, The application of a flexible vessel for containing, and in which to serve, liquors on draught, substantially as described.

50,086.—Chimney Cap.—E. Hinkley and G. W. Crowell, Cleveland, Ohio: We claim the cap, A, the standard, D, and link, b, in combination with the plate, C, the several parts being constructed and arranged as and for the purpose herein set forth.

REISSUE.

73.—Manufacture of Iron.—John D. Williams, Alleghany City, Pa. Patented Aug. 8, 1865. Antedated July 9, 1865:

July 9, 1865: claim the use of the ingredients herein named, and their equiva-its, and the mode of using them, and the manner of operating the race, substantially as described, and for the purpose set forth.

2,173.—Bust of Abraham Lincoln.—Henry Manger, Philadelphia, Pa.:

4.—Carpet Pattern.—Elemir J. Ney (assignor to the Lowell Manufacturing Company), Lowell, Mass.

2,175.—Carpet Pattern.—Elemir J. Ney (assignor to the Lowell Manufacturing Company), Lowell, Mass.

2.176.—Carpet Pattern.—Elemir J. Ney (assignor to the Lowell Manufacturing Company), Lowell, Mass.



tion with the publication of the SCIENTIFIC AMERICAN, have act as Solicitors and Attorneys for procuring "Letters Patent" for ne inventions in the United States and in all foreign countries during the past seconders years. Statistics show that nearly ONE-HALF of al the applications made for patents in the United States are solicited through this office; while nearly THREE-FOURTHS of all the patents taken in fereign countries are procured through the same source. It is almost needless to add that, after sighteen years' experience in pre-paring specifications and drawings for the United States Patent Office, the proprietors of the SCIENTIFIC AMERICAN are perfectly conversant with the preparation of applications in the best manner, and the transaction of all business before the Patent Office; but they take pleasure in presenting the annexed testimonials from ex-Com-

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[See Judge Holt's letter on another page.]

[See Judge Holl's letter on another page.]
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cution of rejected cases has been very great. The principal potential of their charge is generally left dependent upon the final result.

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G. F. G., of N. J.-Putting out fires by steam is old.

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with patent. Steller ber Vertritigten Sinntelle und Angelin und ber Gefchäfteorbnung ber Patent-Office und Anleitungen für ben Erfinder, um fid Patente gu fidern, in ben Ber. Etaaten fowobl als in Europa. Berner Ausging auf ben Patent-Gefehen frember Linber und barauf begögliche Rathfolioge; ebenfalle nügliche Einfe für Erfinder und helde, welche patentiren wollen. Peris 20 Cite, per Poft 20 Cite.

### THOMAS C. THEAKER.

The Hon. Thomas C. Theaker, who has just been appointed by President Johnson Commissioner of Patents, is emphatically a self-made man. His education-eminently qualifying him for the honorable and responsible position he now occupies—has been acquired in the workshop. Though a practical mechanic, of great and varied experience, he has all his life aimed at something higher than mere practical skill as an artisan, and has made himself a proficient in the science of mechanics. He is an inventor, also, and has, previous to his official connection with the Patent Office, taken out several patents for ingenious and useful improvements in the mechanic

Mr. Theaker's past history gives an assurance to that valuable class of our fellow-citizens with whom the great majority of useful inventions originatethe mechanics, artisans and workingmen-that his sympathies will always be with them, and that the interests of inventors will be safe in his hands.

perimentally working in aluminum for several years ry and ornamental work fabricated from that new Cod clay by himself, and attest in a remarkable man-

Aluminum. Dr. N. C. Fowler, of Yarmouth, who has been ex exhibits, at the Boston Fair, many articles of dentistmaterial. His specimens were reduced from Cape ner the hardness and strength, as well as the light-



HON. THOMAS C. THEAKER.

Mr. Theaker was born on the first of February, | ness and material, of this singular metal, the processes 1812, in York County, Pennsylvania. In 1830, when eighteen years of age, he removed with his father's family to Belmont County, Ohio. Soon afterward he became a house carpenter and joiner, commencing his apprenticeship to the business in Zanesville, Ohio, and concluding it in Wheeling, Virginia. While still quite young, he learned, also, the art of machine pattern making. Subsequently he became a skillful millwright, which business he successfully followed a number of years in various parts of Ohio. About twenty years ago, Mr. Theaker established an engine and machine shop at Bridgeport, Belmont County, Ohio, and carried on the business some twelve or fifteen years, giving all the various branches of work there done his personal supervision, and becoming master of all.

In the fall of 1858, Mr. Theaker was elected to Congress from the Belmont district, and was a member of the House of Representatives during the two stormy sessions which immediately preceded the breaking out of the late rebellion.

On the incoming of Mr. Lincoln's Administration, he was strongly recommended by numerous members of Congress with whom he had served, and others, for the office to which he has just been appointed; but, on the accession of Mr. Holloway to that place, he accepted an appointment tendered him by the President on the Board of Examiners-in-Chief, which had just been created by an act of Congress. In that capacity, as most of our readers are aware, he has served with ability ever since.

of working which are in such singular contrast with the methods of treating other minerals. It is not oxidizable, and its specific gravity is below that of rubber, 25 sheets of aluminum, which Dr. Fowler exhibits, weighing but five-eighths of a grain, while the same number of gold sheets of equal size weigh six grains. Some beautiful specimens of embossing with this material are shown. - Boston Advertiser.

[Aluminum is less readily attacked by acids than most metals, but it is not strictly true that it is not oxidizable. A considerable portion of every brick wall and every bank of clay is the oxide of aluminum. Clay is the silicate of alumina-silex and alumina-and alumina is the oxide of aluminum.-EDS. SCI. AM.

On the 4th inst., a rope swinging from a water tank on the Chicago and Northwestern Railroad, by a curious result of the laws of motion, wound itself around the neck of N. W. Danks, of Chicago, who was standing on the platform of a car looking off, and as the train dashed by he was jerked off and hung suspended till the train passed by, when the rope unwound and he fell to the ground insensible, but was restored to consciousness. So relates a Chicago paper.

In a vacuum, all electrified bodies speedily lose their excitement, while in a dry, dense air, they retain it longest. Nevertheless, slight electrical excitement can be produced in a vacuum by friction.

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